NETWORK WORLD

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Wellfleet stacks the deck in the router market

BY JIM DUFFY AND SKIP MACASKILL

Billerica, Mass.

Wellfleet Communications, Inc. this week will become the first major internetworking vendor to unveil a stackable router that can be configured as a remote access device for branch offices and then scaled up to serve larger sites or departments.

The Access Stack Node will feature four slots housing LAN and WAN interface cards as well as a 200M bit/sec bus interface module, called the Stack Packet Exchange Interconnect (SPEX), that ties together the stackable units, according to analysts briefed by the company. Each module will sport as many as two LAN or WAN ports.

Xyplex's new backplane turns a high-end routing hub into a scalable enterprise LAN switch. Page 6.

What's unique about the Access Stack Node is its scalability through stackability. Users can start out deploying the system as a two-port remote access router and incrementally increase ports and processing power by adding cards to a chassis and then linking multiple chassis via the SPEX interface.

As many as four Access Stack Nodes can be stacked together to configure a single mid-range router with a maximum port capacity of 24.

While some hub vendors, including Fibermux Corp. and Hewlett-Packard Co., currently offer routers that can be included in a hub stack to provide local routing capabilities, Wellfleet's Access Stack Node will be the first stackable router to scale upward and offer wide-area connectivity.

See **Wellfleet**, *page 90*

REVIEW

Organizing document chaos

SoftSolutions 4.0 can help organizations dig out from under a blizzard of on-line documents. **Page 65.**

AT&T in outsourcing coup

Pending deal to give carrier control over CSX Transportation net.

BY JOANIE WEXLER

Jacksonville, Fla.

CSX Transportation, Inc. is poised to hand over its entire corporate network operation to AT&T and dissolve its 1,000-person communications and information systems staff, according to documents obtained by *Network World*.

The two companies have reached a preliminary agreement under which CSX would outsource communications functions to AT&T Global Information Solutions, phasing out nearly all CSX technology personnel over five years and cutting annual technology costs by as much as $20 million.

CSX runs one of the largest private networks in the U.S., comprising 225 miles of microwave links, 3,000 miles of fiber and 8,900 miles of telephone line. The company's annual budget for voice service alone is $50 million — much of which already goes to AT&T.

CSX's outsourcing impetus

- Current network is **"outdated, obsolete and held together with chewing gum and baling wire," according to CSX documents.**
- Cost to upgrade **CSX private net to latest technology would be about $500 million.**
- Annual operational savings **for CSX could approach $20 million.**

The contract is not signed yet. CSX acknowledged that it is in discussions with AT&T but declined to comment further, and AT&T refused to discuss the talks at all.

But according to a memo sent late last month to CSX communications staff from its union, the International Brotherhood of Electrical Workers (IBEW), an early agreement has been fleshed out under which AT&T would purchase all of CSX's LAN, WAN and

See **Coup**, *page 91*

Potential rivals Lotus and Oracle team up for enterprise groupware

BY BARB COLE AND ADAM GAFFIN

San Francisco

Lotus Development Corp. and Oracle Corp. last week agreed to integrate Notes and Oracle7 to help users build enterprise groupware systems supporting both transaction- and document-based applications.

The move surprised industry watchers who considered Oracle to be one of Lotus' few potential challengers in the groupware market. Oracle even announced a product last week called Documents that was initially designed as a Notes killer.

But the vendors said they were bowing to growing user demand for more efficient ways to integrate unstructured data, such as Notes documents, with structured data, such as financial information stored in Oracle databases. They announced their development and marketing relationship at the International Oracle Users Week conference here.

"As we become more invested in Notes and more invested in Oracle, the relationship can't help but benefit us," said John Stiles, groupware product manager at US

See **Groupware**, *page 92*

VOICE/DATA INTEGRATION

ATM hums, but can it sing?

BY MICHAEL CSENGER

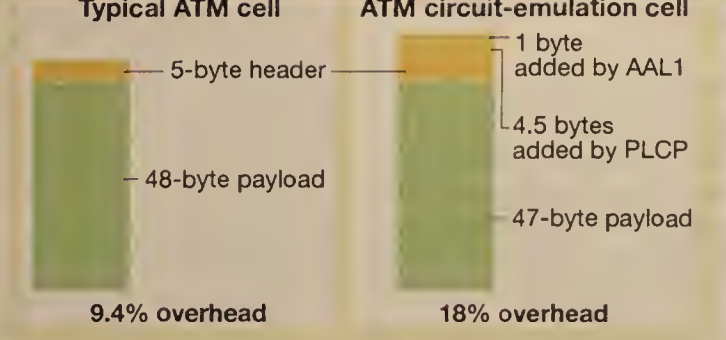
Like any bright dream ruined by the morning, ATM's promise of unified voice, data and video is in peril of its own rising sun.

Asynchronous Transfer Mode today is defined almost entirely by data needs. Voice and video traffic is handled by circuit emulation, which can crudely imitate a T-1 or T-3 link within an ATM bitstream. But circuit emulation is inefficient and does not provide the dynamic interleaving of traffic types that users expect of ATM.

For the many network planners waiting for the ATM market to ripen, voice is often deemed the missing element. Without effec-

See **ATM**, *page 92*

Voice puts a burden on ATM



Carrying voice over ATM via circuit emulation doubles overhead, reducing circuit efficiency. T-1 circuits carved out of ATM bitstreams to transport voice consume bandwidth even when idle, further decreasing efficiency.

AAL1 = ATM Adaptation Layer 1
PLCP = Physical Layer Convergence Protocol GRAPHIC BY SUSAN SLATER

DB2 replication reaches out to Oracle, Sybase

BY BARB COLE

San Jose, Calif.

In a move that could give DB2 a bigger role in client/server applications, IBM next week will announce a replication tool that works with databases from Oracle Corp. and Sybase, Inc., as well as software for managing those databases centrally.

DataPropagator Relational will work with IBM's DataJoiner middleware to let users copy information to Oracle and Sybase databases from versions of DB2 running on hosts, OS/2 machines, RISC System/6000s and Hewlett-Packard Co. HP-UX Unix systems. Multivendor replication could be a big boost for IBM's DB2, which controls much of the legacy data that companies want to tap into from their client/server systems.

Oracle and Sybase today offer replication, as well as gateways to mainframe data, but the replication capabilities only work with their own databases. However, Sybase is reportedly working on a gateway that would replicate DB2 data directly into Sybase servers.

See **DB2**, *page 91*

Briefs

Driving on the Infobahn. *NW* Contributing Editor Mark Gibbs will deliver seminars on "Capitalizing on the Internet" as part of *NW*'s Technical Seminars series. Participants will learn how to navigate the net and what tools are available for doing business over it. The daylong seminars cost $395. The schedule is: Oct. 24, Philadelphia; Oct. 26, Atlanta; Oct. 27, Dallas; Nov. 3, Chicago; Nov. 4, New York; Nov. 7, Washington; Nov. 9, Boston; Nov. 30, Houston; Dec. 1, Minneapolis; Dec. 6, Los Angeles; Dec. 7, San Francisco.

NW: (800) 643-4668.

It's a SNAP. Four companies last week moved to fill in key pieces of their routing strategies by licensing Data Connection, Ltd. of London's SNA-Data Link Switching (DLSw) code. 3Com Corp., Cabletron Systems, Inc., CrossComm Corp. and Hewlett-Packard Co. licensed the code, which will enable them to implement a standard way of transporting Systems Network Architecture and Network Basic I/O System traffic over TCP/IP nets in their products. SNAP-DLSw is IETF Request For Comment 1434-compliant, which ensures multivendor router compatibility. IBM, Wellfleet Communications, Inc. and others support the standard.

Serving up Notes. The cavalcade of Notes servers continued last week as Lotus Development Corp. rolled out versions for Windows NT and Novell, Inc. NetWare 4.0X. This week, Lotus is expected to announce imminent shipping of several Unix servers for Notes, including HP-UX, AIX and Solaris 2.3.

Pricing for all servers starts at $495 each.

Lotus: (800) 828-7086.

Teleos eyes ISDN. Teleos Communications, Inc. today will introduce a family of switches optimized for videoconferencing over ISDN services. The AccessSwitch family, comprising four scalable products, will handle data traffic, as well. The smaller units provide local switching and access to the wide area, while the larger units can serve as a backbone switching node.

Prices range from $14,500 for 16 desktop interfaces to $160,000 for a fully configured Enterprise AccessSwitch supporting 80 T-1 circuits.

Teleos: (908) 389-5700.

Electronic commerce for your health. The Department of Health and Human Services (HHS) last week became the first civilian agency to use the electronic data interchange hub set up by the Department of Defense to support multiple value-added networks. HHS issued its first on-line bid request for scientific equipment, following through on President Clinton's mandate to use EDI in procurements.

Management SMARTs. The Network Management Forum, based in Morristown, N.J., is forming a working group to automate business processes between carriers, their customers, suppliers and other service providers. The group, called the Service Management Automation and Re-engineering Team (SMART), will define requirements for automating high-priority processes, such as activating a customer service record, modifying the configuration of a circuit or generating performance statistics. The group will then select and endorse which technology will be used to achieve automation. SMART plans to complete its work within two years.

Toys R Us plays with SynOptics. No toying around here. SynOptics Communications, Inc. this week will announce it has been selected by Toys R Us to supply the nationwide retail chain with more than 600 intelligent hubs as part of its network upgrade program. The deal, which will be worth more than $10 million over the next five years, is part of the toy store's initiative to revamp its network to increase profitability and enhance customer service.

Save the LANalyzer. The future of Network Communications Corp.'s (NCC) LANalyzer product is in serious jeopardy. A dispute broke out last week about corporate strategy at a shareholders' meeting that led to the dismissal of the entire board of directors and George Wood, president and CEO of NCC since January 1993. NCC, which purchased the rights to the Novell, Inc. LANalyzer net analysis tool in March 1993, had been planning to roll out a new release of the product early next year to handle LAN, WAN and ATM analysis. But the new management team has decided to slow the pace of that project and refocus on the company's WAN analysis roots.

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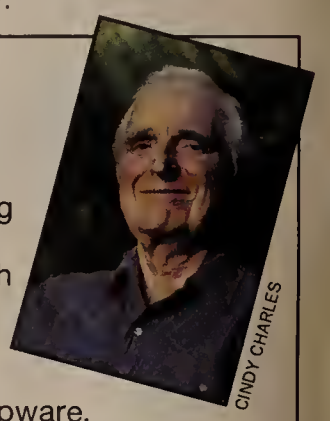
Network Innovator



Interactive computing visionary **Doug Engelbart**'s research paved the way for such fixtures in today's networking environment as groupware, display editing and the ubiquitous PC mouse.

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Network HELP desk

Network World *tracks down answers to your questions regarding products, services, technologies or disputes with vendors. Please submit questions to Dana Thorat at (800) 622-1108, via fax at (508) 820-1103 or (508) 820-3467, via the Internet at djt@world.std.com or via CompuServe at 73244,2673.*

Can you provide contact information for the North American ISDN Users' Forum (NIUF)?

Stephen Marino, Cos Cob, Conn.

NW found that the NIUF, an organization of ISDN-interested parties, is coordinated by the National Institute of Standards and Technology (NIST). To contact the NIUF secretariat at NIST, write to NIUF secretariat, NIST, Building 223, Room B364, Gaithersburg, Md., 20899. You can also contact them at (301) 975-2937, via fax at (301) 926-9675 or via the Internet at dawn@isdn.ncsl.nist.gov.

Our company's Connecticut office has a character-based accounting application running on an IBM RISC System/6000 with an internal 128-port asynchronous controller and two external 16-port serial concentrators. We have 22 IBM 3151 terminals, four serial printers and one parallel line printer connected to the RS/6000. We also have six Macintoshes on a 10Base-T Ethernet network.

In our Massachusetts office there are also Macintoshes on an Ethernet, but they lack access to the RS/6000 accounting application in Connecticut.

The offices are connected with a full T-1 digital link between two SynOptics Communications, Inc. hubs — with a data service unit/channel service unit on each end.

What software do I need so that the Macintosh users can access the accounting application on the RS/6000 and transfer ASCII files from it to their Macintoshes? Will we be able to print accounting reports to a LaserWriter on the Ethernet?

Todd Pietri, Duluth, Ga.

Kee Nethery, an engineer at Kagi Engineering, a Berkeley, Calif., consulting company and organizer of the Mactivity Trade Show network, replies:

The odds are very good that the Macintoshes can telnet to the accounting program through their Ethernet connection. However, be forewarned that the WAN connection required to link the two remote sites will be costly.

Contact the vendor of the accounting software to

See **Help desk**, *page 53*

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VINES NETWORKING

Banyan previews VINES 6.00, ENS for Windows95 to users

BY PEGGY WATT

Providence, R.I.

Banyan Systems, Inc. previewed its upcoming VINES 6.00, which features a new net management architecture, and offered a peek at Enterprise Networking Services (ENS) for Windows95 at the Association of Banyan Users International (ABUI) conference here last week.

The Westborough, Mass., firm also fulfilled recent promises to spin off some ENS functions into other products and showed a Beyond Mail update that incorporates Intelligent Messaging III capabilities and other ENS technology.

Primary changes to VINES, expected in the first quarter of 1995, are directory enhancements and a new distributed management architecture called Distributed Enterprise Management Architecture (DeMarc), which was first discussed last August.

WHAT'S IN DEMARC

DeMarc comprises network and server agents, as well as, event management services, supporting Simple Network Management Protocol, Microsoft Corp.'s Open Database Connectivity and SQL, said Bob Rentsch, VINES product manager at Banyan.

The upgrade in the Banyan StreetTalk directory will enable groups of users to be replicated across servers to ensure logon, even if a home server is off-line.

Among the other planned directory service enhancements are support for 50 StreetTalk groups per server, X.500 interoperability and new list features, according to Rentsch.

Before VINES 6.00 ships, Banyan expects to release a maintenance update, perhaps before year end.

KULL

ENS FOR CHICAGO

On the ENS front, Banyan demonstrated ENS for Chicago (now called Windows95), which uses the graphical interface and browsing capabilities of the Microsoft Corp. 32-bit operating system but maintains ENS security and StreetTalk directory service, said Bill Johnson, vice president of product marketing for Banyan.

Its primary components are a 32-bit file system driver (redirector), communications stack, print driver and support for multiple file services.

Banyan expects to ship the product in mid-1995, when Microsoft releases its Windows95.

Users welcomed the broader implementation of ENS, a Banyan hallmark.

"It's very rare to see only one environment in a VINES installation," said Ted Kull, ABUI president. Putting parts of the ENS on more platforms is a smart strategy that will fortify Banyan, he added.

And that was certainly noted by users. "The VINES ENS lets me integrate all our networks," said James Shield, staff sergeant and manager of medical information systems at Whiteman Air Force Base in Missouri.

Shield's VINES net supports three servers and 240 clients, but the rest of the base runs NetWare, Windows NT and HP-UX networks, he said. The broader Banyan's ENS support, the easier his connectivity task.

The first ENS module to go into another vendor's product is the StreetTalk directory network service, which is being incorporated into National Directory Assistance, an electronic directory service marketed by Metromail, a subsidiary of R.R. Donnelly & Sons Co. in Chicago.

The revised BeyondMail 2.0 combines Banyan's StreetTalk global directory and Intelligent Messaging technology with BeyondMail. It integrates with Banyan's ENS, uses StreetTalk rules and applies the client/server approach found in Intelligent Messaging. BeyondMail 2.0 users can also access Lotus Development Corp.'s Notes mail directly.

Cisco, IBM may butt heads over net technology patent

BY MICHAEL COONEY

The battle between Cisco Systems, Inc. and IBM for control of your multiprotocol backbone network may get bloody.

Sources indicate that IBM is sitting on a patent that could derail Cisco's effort to build a mainframe channel-attached router. The patent covers the way LAN devices communicate with other network nodes, such as controllers or routers.

According to sources, IBM has been quietly discussing the patent issue as a potential problem with Cisco's channel-attached router as it briefs analysts on its own future plans. Analysts said IBM is using the tactic to take the steam out of Cisco's announcement of its channel-attached router, which may come this month.

According to Cisco executives, the patent issue is a red herring, and they anticipate no problems in getting products out the door later this year. They also continued to build the case for their brand of backbone networking at the recent NetWorld+Interop trade show, saying the best way for users to get TCP/IP or SNA to the mainframe is with a channel-attached router and adding that 3172s and 3745s are dead.

But it is precisely that 3172 technology that may cause Cisco problems.

Cisco's new channel-attached router will emulate a 3172. But Bob Kennedy, IBM's 3172 product manager, said IBM has a patent covering the way the 3172 communicates with VTAM on a Systems Network Architecture host. U.S. Patent No. 5,245,608 applies to the "communications architectures for communicating between nodes, such as a processor and a LAN device."

"Cisco scares the hell out of IBM, and this channel-attached router scares them the most because it could eat right into some of the biggest SNA corporate backbones out there."

Kennedy said, "It basically describes how two software components communicate, and it is implemented in the 3172's Link Services Architecture [LSA]."

The 3172 and LSA are unique in the traditional SNA scheme because the 3172 communicates transparently to the host — the only SNA-related device that is networked this way. All other SNA devices have a physical unit designation to the host.

Cisco, with its channel-attached router, will be one of the first companies to emulate a 3172 as an LSA-type device. McDATA Corp. reverse-engineered LSA, sources noted, but IBM has not raised concerns.

An IBM spokesman said IBM does not have access to Cisco documentation and does not know if the patent issue would be an impediment to Cisco's plans. According to the spokesman, IBM has not informed Cisco that the patent would be a problem.

"If there were a patent problem, IBM is contractually sworn to tell us about it," said Nick Francis, director of IBM programs for Cisco. "We aren't aware of anything proprietary in the 3172 interface, and we are going full-steam ahead."

But IBM's public statements belie the concerns it is expressing in private. The depth of IBM's concerns has even become apparent in recent public remarks.

In a not-too-subtle criticism aimed at Cisco, Rick McGee, director of IBM's controller lines, last month promised to "kill" vendors and "eat our own young" before IBM would let any rival cannibalize its channel-attached segment of the network.

"Cisco scares the hell out of IBM, and this channel-attached router scares them the most because it could eat right into some of the biggest SNA corporate backbones out there," said one analyst.

Cisco spurred the backbone battle by licensing IBM Enterprise Systems Connection channel-attached interface cards from IBM's Large System Division and promising to put the technology into the 7000 Internetwork Router (*NW*, Jan. 10, page 13).

"A patent battle would be [Advanced Peer-to-Peer Internetworking] all over again, unfortunately," said Anura Guruge, an independent analyst based in New Ipswich, N.H. "Anything's possible; IBM plays the patent game better than anybody else."

APPI was a Cisco-backed technology it pushed as an alternative to IBM's Advanced Peer-to-Peer Networking technology. It failed, in part, because IBM held patents on technology APPI needed to succeed.

Forum takes action to control ATM network congestion

BY JOANIE WEXLER

Ottawa

The ATM Forum last week signed off on a general scheme for managing traffic congestion in emerging Asynchronous Transfer Mode networks.

The group's near-unanimous decision to design a specification for ATM switches and adapter cards around a so-called rate-based approach should make it easier for users to design networks that maximize bandwidth utilization, observers said.

The ATM Forum

The rate-based mechanism — for which a specification should be available in the second quarter of next year — defines how a public or private ATM network will feed back information about the network's available capacity to the source workstation, server or switch. This will allow the sending system to appropriately adjust the rate at which it passes cells into the network, said Natalie Giroux, chairman of the ATM Forum's traffic management working group.

This function is particularly important in LAN/WAN ATM internetworks, where the speeds of the two nets do not match. If the WAN bandwidth is less than that of the LAN feeding into it, the WAN can get clogged, resulting in response time delays or even cell loss and data retransmissions.

While there were arguments within the forum about the most efficient type of congestion control, the important thing for users is that a common scheme has been chosen, said Steve Byars, executive director of the network products group at equipment maker and ATM Forum member Netrix Corp., based in Herndon, Va. "Any [standard] that implements proactive congestion management prevents cell loss and, thus, minimizes retransmissions," he said.

The scheme will also let vendors build ATM products now that, while not forum-compliant, adhere to the rate-based concept. This means vendors can get product out the door will require minimal tweaking when the specification is released, Giroux said.

The rate-based approach beat out its chief opponent, known as credit-based flow control. With a credit-based system, the receiver tells the sending device when and how much to transmit.

Today, many ATM products contain no flow control at all for speed-matching between networks, sometimes wreaking havoc with net throughput when traffic throttles from higher to lower speeds (see story, page 40).

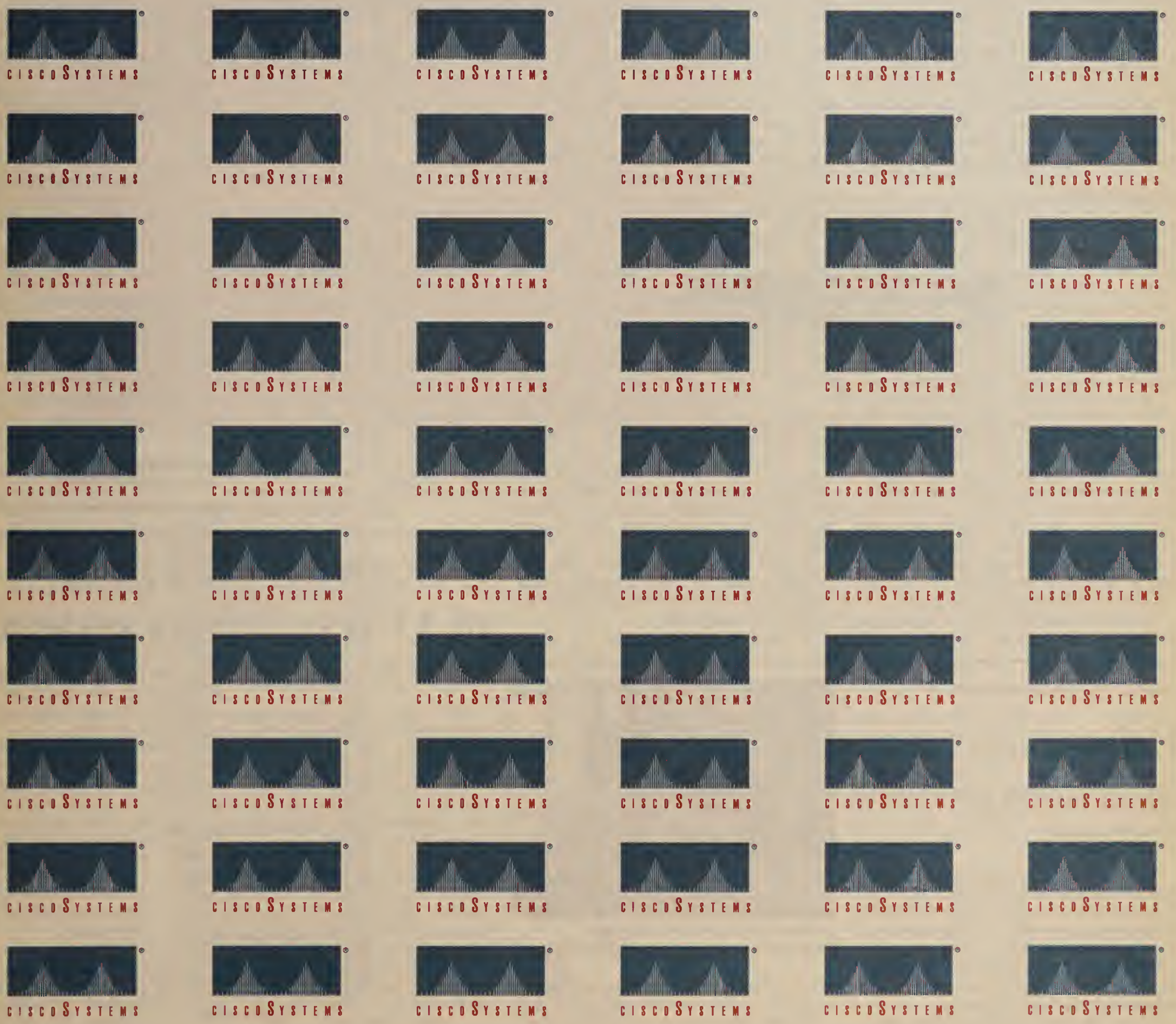
Ron Jeffries, principal of Jeffries Research in Santa Maria, Calif., pointed out that the rate-based scheme the forum chose matches the one proposed for the LAN Emulation standard, designed for allowing Ethernet-connected computers to communicate with other Ethernet-connected and ATM-connected computers over an ATM net.

There are already ATM switches on the market that are rate-based but proprietary, including those from StrataCom, Inc. and Adaptive Corp. Digital Equipment Corp., on the other hand, makes a switch with flow control based on the credit mechanism. Other vendors, like SynOptics Communications, Inc., have not yet implemented flow control.

CORRECTION

Pacific Office Automation, Inc.'s packet voice application described in a recent article (*NW*, Sept. 26, page 1) runs over the PakLink frame relay service provided by PacNet, not Pacific Bell's PacNet network.

Here's A List Of All The Companies That Can Solve All Of Your Low-End Internetworking Problems.



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Xyplex puts its spin on switching

Architecture lets users swap out midplane for new backplane.

BY SKIP MACASKILL

Boxborough, Mass.

Xyplex, Inc. next week will unveil an upgraded backplane that turns its high-end routing hub into a scalable enterprise LAN switch.

The new SwitchPlane distributed architecture will expand the capabilities of the Network 9000 Routing Hub by swapping out the existing midplane for a new switch-based backplane that has multigigabit capacity and uses low-cost serial links to connect modules.

"Unlike other vendors that require the purchase of a new hub, Xyplex will let me upgrade to switching by merely swapping out my midplane," said Scott Conti, a Xyplex user and director of network services at the College of Natural Sciences and Mathematics at the University of Massachusetts-Amherst. "Its approach is scalable and lets me migrate at my own pace."

TAKING NOTICE

The announcement, coupled with the fact that Xyplex will gain greater financial backing when it is officially acquired by Raytheon Co. next month, may make users take notice, according to Charlie Robbins, vice president of communications research at Aberdeen Group, Inc., a Boston-based consultancy.

"Since this switching market is still emerging, users are more willing to evaluate a wider range of vendors, and Xyplex's translational frame switching approach is worth a look," he said.

SwitchPlane, which will support all existing 9000 modules, offers an 8.4G bit/sec capacity spread across seven of the 15 slots in the 9000. Each of those seven slots will have a full-duplex 200M bit/sec serial connection to each of the six other switching slots.

Those seven slots will support a series of new switching modules that feature field-programmable gate arrays, which can be configured to switch traffic among the end nodes connected to that card. As more modules are added, the overall switching capacity for the device increases — a degree of scalability not possible in centralized processor architectures.

The serial connection approach is an alternative to the high-speed 32-bit-wide parallel bus other vendors use as a superhighway for traffic going between modules. Xyplex's scheme will eliminate the high cost associated with the parallel bus architecture and the single point of failure of the centralized processor.

In the first half of 1995, Xyplex will roll out the 600 Series switching modules that support dedicated 10Base-T and 10Base-FL Ethernet, as well as Fiber Distributed Data Interface links to LAN segments, high-end users or critical servers. The modules will also support 100M bit/sec Ethernet technology.

The initial 10Base-T modules will feature 16 ports, allowing the 9000 to support as many as 112 ports of switched Ethernet.

Packets will be switched across the device in native mode and converted to a different frame size only as needed at the output port, a technique known as translational frame switching.

Xyplex will also roll out the 500 Series of routing modules for the 9000 that provide connectivity to campus and wide-area backbones, as well as between the different virtual LANs that the switch will support in the second half of 1995. The router modules will additionally provide an interface to an Asynchronous Transfer Mode switch or public network.

As ATM standards become more stable, each switching module will be able to perform ATM segmentation and reassembly, converting packet-based traffic into fixed-length cells.

©Xyplex: (800) 338-5316.

SwitchPlane pricing

Product	Availability	Pricing
SwitchPlane	4Q	$1,500
600 Series switch modules	First half of 1995	$7,995-$11,995
500 Series router modules	First half of 1995	$8,990-$17,990

Users lament workflow tools' missing elements

BY KEVIN FOGARTY

Users who have successfully deployed workflow systems to link departments or workgroups are interested in using it at the enterprise level but say technological and organizational problems are holding up their progress.

Workflow applications lack security, do not integrate tightly enough with other applications on a network, don't let users add analysis tools and don't include tools to build and modify complex workflow models for large organizations, according to users attending the Work Management '94 conference here last week.

Most workflow products provide some links to other applications but do not integrate easily with homegrown applications or desktop software such as Microsoft Corp.'s Excel, said Wallace Price, vice president of technology development at Residential Services Corporation of America, a mortgage bank subsidiary of Prudential Insurance Company of America.

Price wants to link existing analysis and other tools to a workflow system to give users the ability to do complex cost-justification and other calculations. "But I don't want to take on the cost of rebuilding applications just

See Workflow, *page 90*

USER YAP

"Rules, routes and roles, that's what workflow can give you. What the business side needs is a tool that can look at business processes."

Wallace Price

"The assumption is that your network is basically secure under the workflow. That may or may not be true."

Lawrence Sewell

"It can take a year to design a [workflow] process if you get the tool first, knock together something and keep knocking down versions until you get one you like."

IS manager, large trucking company

VIDEO TO THE DESKTOP

Unisys, Sony zoom in on video products

BY ELLEN MESSMER

Unisys Corp. and Sony Corp. are using different means to bring users the same end: videoconferencing.

In an effort to wow users looking for a high-quality desktop system that works over both Ethernet and wide-area nets, Unisys last week unveiled a packet-video product based on a 486-based PC fully outfitted for full-screen interactive videoconferencing and data collaboration at up to T-1 or E-1 speed.

And for those searching for a rollabout system for small-group conferencing, Sony Corp. is rolling out the Trinicom 2000 at next week's TeleCon XIV conference in Anaheim, Calif. The Trinicom 2000 will be a standards-based video system that works over ISDN lines, switched digital or dedicated digital lines at up to 384K bit/sec.

The Unisys Desktop Videoconferencing System comprises the computer maker's PW2 486 PC with 8M bytes of memory, a 270M-byte SCSI hard disk drive, an H.261 coder/decoder and an Ethernet card.

It also includes a 17-inch color monitor and an SVGA video controller supporting up to 64,000 colors at 640 by 480 pixel resolution, a small camera and a speakerphone with a removable handset for privacy.

Unisys system provides user with interactive video and data collaboration.

The Windows-based video PC, which can also be used to run regular Windows applications, is shipping with software installed for TCP/IP-based packet video. Unisys' product supports point-to-point videoconferencing at up to 22 frames per second, which results in good video quality.

The Unisys data-sharing and whiteboard software that comes with the package is based on Eytel Communications collaboration software adapted to reflect the icons in Microsoft's upcoming Windows95.

Suitable for remote data collaboration between eight separate users, the software is based on Micro-

See Unisys, Sony, *page 90*

GTE gives sneak peek of ATM switching system

BY MICHAEL CSENGER

Needham, Mass.

GTE Government Systems last week provided *Network World* with an exclusive look at its next-generation SPANet ATM switch architecture.

The Secure Prioritized ATM Network switch was originally designed for the Department of Defense in support of projects uniting the department's communications systems. Northern Telecom, Inc. (NTI) resells a version of SPANet as its Magellan Gateway switch.

GTE's new design actually goes by two names: SPANet Generation 2 (G2), or Modular Switching Architecture (MSA). It is a family of components that can stand alone or fit together to satisfy needs from the edge to the core of a network.

"You can start with an edge device, an access switch, and later grow it up to be a 10G-bit core switch," said Ken Napier, GTE's director of sales and marketing.

In a private network, for example, a SPANet G2 edge device would handle local traffic switching chores while providing access to the wide area. In a carrier network, the same device would consolidate traffic from multiple users and pass it to a core switch.

Most other solutions call for one type of device at the edge of the network and another in the backbone. "You get into support and architectural issues that cause headaches," Napier said. "With MSA, you can take a line card from the edge and place it anywhere else in the network — the engineering is all the same."

"You can start with an edge device, an access switch, and later grow it up to be a 10G-bit core switch," Napier said.

"What they say is true," said Peter Sevcik, a principal at Boston-based Northeast Consulting Resources, Inc., who is familiar with GTE's design. "The families of boxes you find from other vendors aren't families at all. When you look deeper, you find their components use different technologies from different OEM vendors, with nameplates added on."

MODULAR WAN

GTE's architecture starts with a single switching shelf called the PathMas-

See GTE, *page 90*

"The IBM PS/2 Server 95 Array belongs on every system manager's short list."

Julian Evans
PC Magazine™
UK Edition
December '93

PC MAGAZINE UK EDITORS' CHOICE™

IBM PS/2 Server 95 Array
December '93

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Sybase prepping workgroup pack and Novell deal

BY BARB COLE

Emeryville, Calif.

Sybase, Inc. this week will announce a package of database tools aimed at workgroups and is close to making a deal with Novell, Inc. to offer a bundle of NetWare and SQL Server.

Sybase Workgroup SQL Server 10 will include: the company's flagship SQL Server 10 database; the Open Client application program interface, which lets front-end applications more easily tie into the database; Backup Server; and two database administration tools — SQL Server Monitor for Windows and SQL Server Manager for Windows — sources said.

Workgroup SQL Server 10 will be available immediately for Microsoft Corp. Windows NT and Novell NetWare. An IBM OS/2 version will ship in October, and The Santa Cruz Operation, Inc. Unix version will roll out by the end of the year. Pricing was not available.

Sybase is also readying a product, dubbed SQL ServerWare, that combines its database and connectivity products with Novell's NetWare 4.0 and WordPerfect Office, sources said.

Bundles are viewed as more attractive by users since they are generally less expensive than buying separate stand-alone products and are tightly integrated to ease setup. For example, the bundle will likely come preconfigured to run on a NetWare server, reducing the amount of manual configuration required.

Sybase had no comment on the offerings.

The move is part of a push by Sybase to address the low end of the database market, something its chief competitor, Oracle Corp., has already done with the introduction of Oracle Workgroup Server and an Oracle/NetWare bundle called OracleWare.

Users said the workgroup products are essential because they provide good vehicles on which to develop and pilot new client/server applications. In addition, tighter integration with NetWare is viewed as a plus by many large companies.

"Anything that gives us the ability to start small and build is positive. Anything that supports standards, such as NetWare, is good for us," said Gene Friedman, vice president of applied technology at The Chase Manhattan Bank Corp., a large Sybase customer in Brooklyn, N.Y. Friedman would likely buy the workgroup version of SQL Server for the firm's departments that have not yet downsized but wish to develop pilot projects.

Well covered

Sybase already offers a NetWare Loadable Module version of its database for NetWare as well as a Windows NT version.

According to analysts, the workgroup offerings from both Oracle and Sybase are in response to competitive pressure by Microsoft, which recently unveiled plans to deliver its SQL Server database along with Microsoft Mail, its Windows NT operating system and Systems Management Server in a bundle called Microsoft BackOffice (*NW*, Sept. 19, page 98).

"Clearly, users want to buy from one vendor. That's especially true at the workgroup level," said Jack Karp, an analyst at Affinity Research, Inc. in Greenwich, Conn. "The database companies have to be concerned about users viewing it as easier to implement Microsoft [BackOffice] than it is to put in Oracle or Sybase [offerings]."

INTERNET tip

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

Ethernet education

The Ethernet Page is a World-Wide Web (WWW) resource that provides:

- ✔ **General Ethernet information**
- ✔ **Technical specifications**
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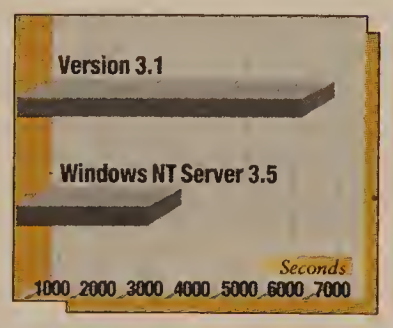

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IBM preps upgrades to ESCON, TCP/IP mainframe software

BY MICHAEL COONEY

Raleigh, N.C.

IBM will this week announce new mainframe-related hardware designed to increase network availability as well as a new version of TCP/IP software for MVS.

The company will unveil a new Enterprise System Connectivity (ESCON) Director that can be configured for full redundancy and supports twice the channel connections as existing Directors. Also on tap is a new version of TCP/IP for MVS mainframes that offers improved printing facilities, application development tools and support for the Open Software Foundation, Inc.'s Distributed Computing Environment.

ESCON is IBM's fiber-optic channel technology for linking controllers, storage devices and other equipment with mainframes at up to 17M byte/sec.

Controllers and other devices connect to ESCON Directors, which, in turn, act as switches that control access to mainframe resources.

The ESCON Director Model 3 is a redesigned box built with IBM technology but manufactured by McDATA Corp. of Broomfield, Colo. The base model supports 28 ports, and users can add capacity in increments of four up to 124 ports, up from the previous limit of 60.

The new version also supports an optional fully redundant processor, a power supply, a Token Ring interface and other features that will guarantee around-the-clock operation, said Bob Neidig, IBM program manager of systems introduction.

"In the past, users had to have two Directors to guarantee operation or to add ports and not take the network down," Neidig said.

The new Director does have some drawbacks, however. It is not compatible with IBM's older ESCON Director Models 1 and 2, and those models cannot be upgraded to the Model 3.

"We think the Model 3 is the new standard for IBM's Directors, but the fact that IBM will essentially force users into a major upgrade could hurt its implementation," said Lucinda Santisario Borovick, research manager of computer networking architecture for the International Data Corp. market research firm in Framingham, Mass.

IBM said the Model 3 will be available Oct. 14 for prices ranging from $139,000 to $250,000.

In the TCP/IP realm, IBM will deliver on promises it made last fall with TCP/IP for MVS Version 3.1.

IBM additions

IBM ESCON Director Model 3 supports:

- 124 ports
- Optional hardware redundancy
- Hot-swappable hardware and software updates

TCP/IP 3.1 for MVS supports:

- Network printing facility
- IMS Sockets interface
- TCP/IP transport for OpenEdition MVS
- Improved SNMP facilities

TCP/IP 2.3 for VM supports:

- New TCP/IP-based shared file system

The software supports IBM's DCE-based OpenEdition for MVS 5.1 platform, which lets users and third-party vendors build distributed, multivendor, cooperative processing applications.

"We've now made mainframe resources open to any type of user," said Dean Fuller, IBM manager of technology marketing for networking products.

IBM also added a TCP/IP Sockets interface to its IMS transaction processing monitor, enabling users to set up transaction processing applications between two or more TCP/IP hosts.

IBM addressed some top requirements from one of its largest user groups, SHARE, Inc., by adding a Network Print Facility that lets TCP/IP users linked to the mainframe print to their local printer, as opposed to mainframe printers as in the past.

But it was too late for some users. US WEST, Inc., for example, beta-tested TCP/IP for MVS Version 3.1 but opted for a third party's implementation of the printing facility.

"At times, IBM seems to be a year behind what we want to do with TCP/IP," said Kevin Harning, a member of US WEST's technical staff in Bellevue, Wash.

On the net management front, IBM added the ability for Simple Network Management Protocol managers to gather data on response times between the mainframe and TCP/IP clients.

Another new feature, dubbed NetStat, lets MVS operators see how many TCP/IP devices are linked to the mainframe and track usage by user.

TCP/IP for MVS 3.1 is available for prices ranging from $25,000 to $99,000.

✆IBM: (919) 254-5593.

ELECTRONIC COMMERCE

Users, vendors to debate course of U.S. EDI specs

BY ADAM GAFFIN

Atlanta

The deadline for integrating U.S. and international standards for electronic data interchange could be pushed back at a meeting this week of a key EDI organization here.

The Accredited Standards Committee X12 Group of the Data Interchange Standards Association (DISA), which oversees U.S. EDI specifications, will debate a motion from representatives of both the transportation and retail industries to delay migration from U.S. specifications, known as X12, to international specifications, known as EDI for Administration, Commerce and Transportation (EDIFACT).

EDI standards divergence

An effort to delay ANSI X12 to EDIFACT migration by 1997 has both supporters and detractors.

For delay

- American Trucking Associations
- Association of American Railroads
- Ciba-Geigy
- Mortgage Bankers Association
- Proctor & Gamble Co.

Against delay

- IBM
- Oracle Corp.
- Rockwell International Corp.
- Westinghouse Electric Corp.

THE OPPOSITION

The motion is opposed by companies that are working with the Department of Defense on its EDI efforts.

X12 and EDIFACT both perform the same general role when transferring data between enterprises; however, they use different syntaxes for describing and carrying out these transactions.

In 1992, the X12 group committed to migrating from X12 to EDIFACT by 1997.

But EDIFACT is not yet as robust or stable as X12 and does not yet support electronic information that is unique to a given country, such as tax data, said Doug Anderson, director of technical services for the American Trucking Associations, which is based in Alexandria, Va.

"We're not against migrating to EDIFACT; we just don't think it's ready yet," he said.

Anderson added that if the motion passes, his group will call for creation of a committee to study how and when to migrate to EDIFACT.

HARMING U.S. COMPETITION

However, any delay in implementation will only harm U.S. competitiveness by forcing companies to use two different sets of EDI standards in electronic commerce, according to the Computer-Aided Acquisition and Logistics Support (CALS) Industry Steering Group (ISG).

If anything, the group would like to see the integration date moved up, said CALS ISG spokesman Carl Nelson.

To demonstrate that the two standards can be brought together, CALS ISG said it will sponsor a series of pilot programs that involve both U.S. and foreign companies in which a single set of EDI applications will be used for exchanging information.

✆DISA: (703) 548-7005.

CrossComm buddies up an ATM, LAN switching initiative

BY JIM DUFFY

Marlborough, Mass.

CrossComm Corp. last week said it plans to deliver a fully integrated network platform that combines routing with Asynchronous Transfer Mode and LAN switching.

As part of its multifaceted switching initiative, CrossComm has formed its own High Speed Networking Division, expanded a joint development deal with General DataComm, Inc. (GDC), and signed licensing agreements with Applied Network Technology, Inc. (ANT) and Multimedia Communications, Inc. (MMC) for Ethernet and ATM switch technology, respectively.

By allying with outside parties to deliver an integrated switch/router, CrossComm's strategy mirrors that of rivals Cisco Systems, Inc., Wellfleet Communications, Inc. and 3Com Corp. But CrossComm lacks the knockout punch, according to analysts.

"The only real downside of this is how they are going to go against the Ciscos and Wellfleets of the world," said Val Sribar, senior research analyst at META Group, Inc. in Westport, Conn. "This strategy says they can deliver this stuff incrementally better. But what they really need is something that blows them away, and they don't have that here."

CrossComm's integrated network device will be based on its XL router line, which has a crosspoint matrix backplane that lends itself to integration of routing and switching in a single system, company officials claimed.

"We will upgrade the [XL] router modules to support ATM, and we will build new LAN and ATM switching modules" for the line, said Nigel Machin, general manager for CrossComm's new High Speed Networking Division. "The biggest benefit is to offer our customers a seamless transition from the LAN/packet world to the switching world by using the same platform."

CrossComm's partners

ANT Providing ASICs for Ethernet switching.

GDC Integrating its Apex ATM switching products with CrossComm's XL line.

MMC Developing ASICs for ATM switching.

Machin would not provide further detail on future products.

CrossComm's new High Speed Networking Division, located in Bolton, Mass., will focus on hardware and software engineering, as well as marketing of the new routing/switching products. The division will be headed by Machin, who most recently was CrossComm's vice president of strategic sales, managing OEM and large customer relationships.

Machin would not say how many CrossComm employees would staff the new division but did say 25% of the company's research and development dollars are earmarked for the group.

Meanwhile, CrossComm and GDC will expand on their long-standing joint product development relationship to include interoperability of GDC's Apex ATM switching products with CrossComm's future XL line. For the past four years, GDC has resold the CrossComm router line under the GDC LAN TMS label. GDC and CrossComm just completed a project to integrate CrossComm's XL router technology into GDC's next-generation TMS products.

In addition, the companies have agreed to expand their marketing and sales programs to jointly market each other's ATM products.

Under its new licensing arrangements, CrossComm will get Ethernet switching application-specific integrated circuits (ASIC) from ANT for use in the XL's LAN switching module. CrossComm will get ATM switching technology for its XL product line by licensing MMC's ATM switching subsystems, which will work with CrossComm-designed ATM interface modules for the XL.

"The fact that this is all in ASICs means we expect to have a lower cost per port and higher integration — i.e., more ports per card — when we deliver," Machin said.

CrossComm will start to unveil LAN and ATM switching products later this year. They will ship in the first quarter of 1995, he said.

Hoever, that's too late for some CrossComm users.

"We actually started looking at other companies' Ethernet switches because CrossComm didn't have anything," said Jim Bustrand, technical support specialist at the *Orlando Sentinel* in Orlando.

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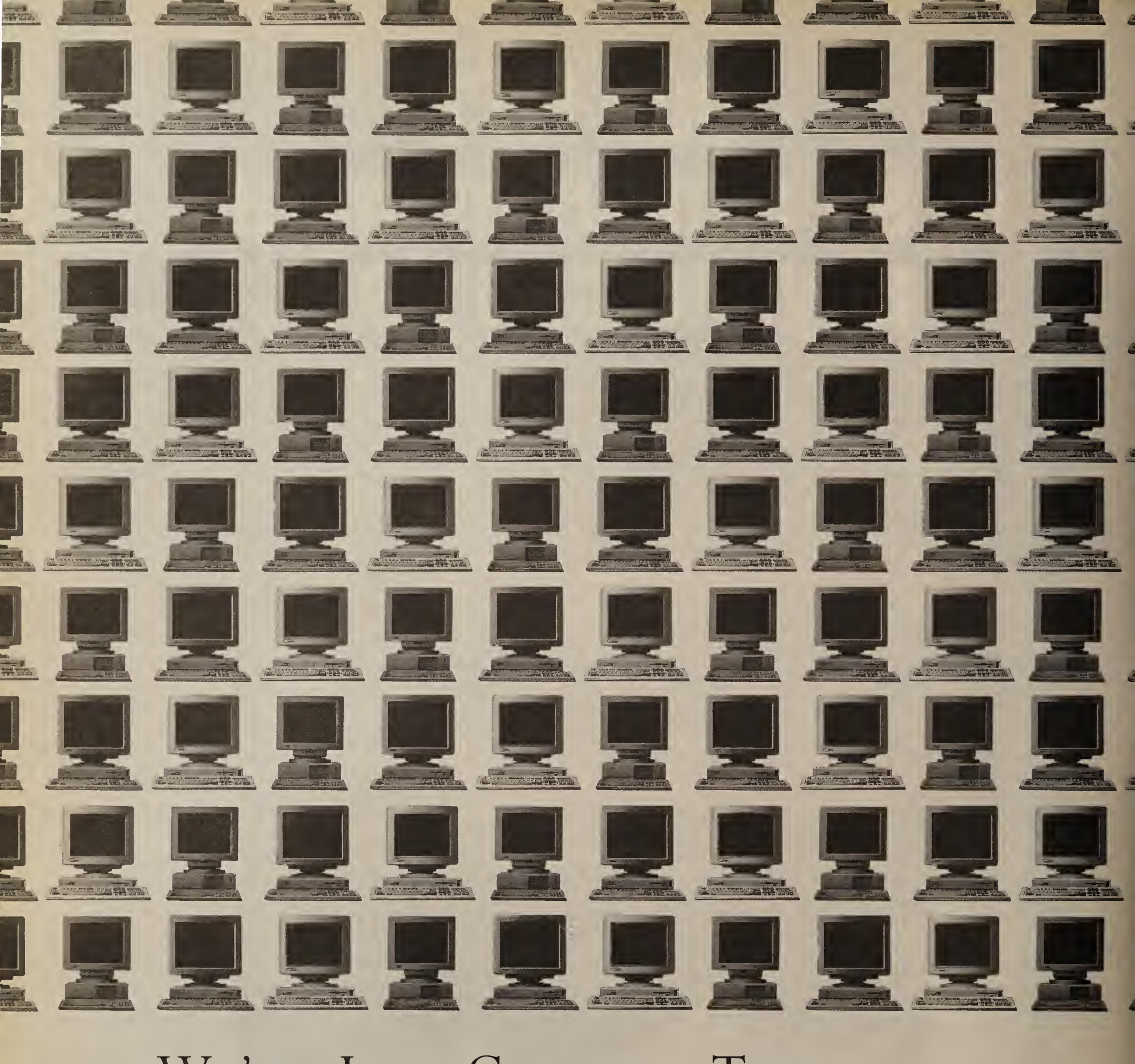

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1 Industry: (check one only)

01. ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04 ☐ Healthcare Services
05. ☐ Hospitality/Entertainment/ Recreation
06 ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/ Agriculture/Forestry)
12. ☐ Government Federal/State/Local
13. ☐ Military
14 ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/ Communications)
18. ☐ Systems/Network Integrators (VAR/VAD/ VAN/Systems/Software Houses)
19. ☐ Distributors Communications/ Computers
20. ☐ Other_____

2 What is your Job Function? (check one only)

NETWORK IS Management:

1 ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4 ☐ IS,IT,MIS,Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO,CEO,PRES,VP, DIR,MGR,Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other_____

3 What Is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 59 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)
1. ☐ Corporatewide
2. ☐ Multienterprise
3 ☐ Departmental
4 ☐ None

B. INVOLVEMENT (check all that apply)
1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

5 Check ALL that apply in columns A and B:

A: I am involved in the purchase of the following products/services.
B: I plan to purchase the following products/services.

A	B	LOCAL AREA NETWORKS (100)
☐	☐	01. Local Area Networks
☐	☐	02. Network Operating Systems Software (NOS)
☐	☐	03. LAN Storage Devices (optical, tape, disk, etc.)
☐	☐	04 LAN Backup Systems (optical, tape, disk, etc.)
☐	☐	05. Network Test Equipment/Diagnostic/ Management Software
☐	☐	06. Hubs/Intelligent Hubs
☐	☐	07. Cables, Connectors, Baluns
☐	☐	08. UPS
☐	☐	09. Network Adapter Boards/Network Interface Cards
☐	☐	10 Peer-to-Peer LANs
☐	☐	11. Wireless Networks
☐	☐	12 SNMP Network Management
☐	☐	13 ATM Switches
☐	☐	14 Remote LAN Access
☐	☐	15 Ethernet Switches
☐	☐	16 LAN Servers
☐	☐	17 Superservers
☐	☐	18 Remote Access/Communications Servers

A	B	REMOTE/WIRELESS COMPUTING (101)
☐	☐	19 Laptops
☐	☐	20 Notebooks
☐	☐	21. PDAs
☐	☐	22. PCMCIA
☐	☐	23 Mobile Data Services
☐	☐	24 Wireless Data Services
☐	☐	25 Wireless Data Equipment

A	B	INTERNETWORKING (102)
☐	☐	26. Bridges
☐	☐	27 Routers
☐	☐	28. Gateways
☐	☐	29. Bridge/Routers

A	B	COMPUTERS/PERIPHERALS (103)
☐	☐	30. Micros/PCs
☐	☐	31 Minis
☐	☐	32. Mainframes
☐	☐	33 Workstations
☐	☐	34 Front-End Processors
☐	☐	35. Terminals
☐	☐	36. Printers
☐	☐	37 Cluster Controllers
☐	☐	38 Fax Machines
☐	☐	39 Monitors

A	B	SOFTWARE/APPLICATIONS (104)
☐	☐	40 Network Management
☐	☐	41 Systems Management
☐	☐	42 Micro to Mainframe
☐	☐	43 Security
☐	☐	44 Communication/Terminal Emulation
☐	☐	45 Word Processing
☐	☐	46 Operating Systems
☐	☐	47 Client Server Applications Development

A	B	SOFTWARE/APPLICATIONS (cont'd)
☐	☐	48. Applications Development
☐	☐	49. Data Base Management/RDBMS
☐	☐	50. Spreadsheet
☐	☐	51. Groupware
☐	☐	52. EDI
☐	☐	53. E-Mail
☐	☐	54 Windows/Graphical User Interface
☐	☐	55. 4GL Development/Case
☐	☐	56. Multimedia
☐	☐	57. Graphics/DTP
☐	☐	58. Remote Access
☐	☐	59. Imaging
☐	☐	60. Suites
☐	☐	61. Middleware
☐	☐	62. Document Management

A	B	WIDE AREA NETWORKS EQUIPMENT & SERVICES (105)
☐	☐	63. Modems (9.6K bps and over)
☐	☐	64. Modems (under 9.6K bps)
☐	☐	65. T-1/T-3 Multiplexers
☐	☐	66. T-1/T-3 Services
☐	☐	67. Inverse Multiplexers
☐	☐	68. Fractional T-1
☐	☐	69. SMDS
☐	☐	70. ATM (Asynchronous Transfer Mode)
☐	☐	71. Matrix Switches
☐	☐	72. Packet Switches
☐	☐	73. Protocol Converters
☐	☐	74 Diagnostic/Test Equipment
☐	☐	75. DSU/CSU
☐	☐	76. Microwave
☐	☐	77. Fax Boards/Modems
☐	☐	78. VSAT
☐	☐	79. Fiber Optic
☐	☐	80 Satellite
☐	☐	81. ISDN
☐	☐	82. PBXs (over 1000 lines)
☐	☐	83. PBXs (under 1000 lines)
☐	☐	84. Automatic Call Distributors
☐	☐	85. Voice Messaging Systems
☐	☐	86. Videoconferencing/Teleconferencing
☐	☐	87 Voice Response/Processing
☐	☐	88. Dedicated Leased Line
☐	☐	89. Switched Data
☐	☐	90. E-Mail/Online Services
☐	☐	91. Image Processing
☐	☐	92 800/900 Services
☐	☐	93. WATS/MTS
☐	☐	94. International
☐	☐	95. Virtual Networks
☐	☐	96. Frame Relay
☐	☐	97 Value Added Services
☐	☐	98 CIT (Computer-Integrated Telephony)
☐	☐	99 None of the above (1-98)

6 What is the total number of LANS, Workstations/Nodes: At this Location/ In your Organization?

	At This Location: LANs		At This Location: Workstations/ Nodes		Entire Organization: LANs		Entire Organization: Workstations/ Nodes
1.	☐	5000+	☐	1.	☐	5000+	☐
2.	☐	1,000 - 4,999	☐	2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐	3.	☐	100 - 999	☐
4.	☐	50 - 99	☐	4.	☐	50 - 99	☐
5.	☐	10 - 49	☐	5.	☐	10 - 49	☐
6.	☐	9 or less	☐	6.	☐	9 or less	☐
7.	☐	None of the above	☐	7.	☐	None of the above	☐

7 Check ALL that apply in columns A and B:

A: The following network platforms are currently installed.
B: The following network platforms are currently planned.

A	B	NETWORK ARCHITECTURES (55)
☐	☐	01. SNA
☐	☐	02. DECNET
☐	☐	03. MAP/TOP
☐	☐	04 TCP/IP
☐	☐	05. DCA (Unisys)
☐	☐	06. X.25
☐	☐	07. Novell IPX/SPX
☐	☐	08. APPC/APPN/LU6.2
☐	☐	09. NETBIOS
☐	☐	10. OSI
☐	☐	11. APPLETALK
☐	☐	12. NSF
☐	☐	13. XNS
☐	☐	14. OTHER_____

A	B	NETWORK OPERATING SYSTEM (56)
☐	☐	15. LOCALTALK (APPLETALK)
☐	☐	16. BANYAN (VINES)
☐	☐	17. DCA (IRMALAN)
☐	☐	18. DCA (10-NET)
☐	☐	19. IBM (LAN SERVER)
☐	☐	20. IBM (PC LAN PROGRAM)
☐	☐	21. MICROSOFT (LAN MANAGER)
☐	☐	22. NOVELL (NETWARE, 2X, 3X, 4X)
☐	☐	23. PROTEON (PRONET)
☐	☐	24. 3COM (3+, 3+OPEN)
☐	☐	25. ARTISOFT (LANTASTIC)
☐	☐	26. HAYES (LANSTEP)
☐	☐	27. DEC (PATHWORKS)
☐	☐	28. WINDOWS NT/ADVANCED SERVER
☐	☐	29. OTHER_____

A	B	LAN ENVIRONMENT (57)
☐	☐	30. 4M TOKEN RING
☐	☐	31. 16M TOKEN RING
☐	☐	32. ARCNET
☐	☐	33. ETHERNET
☐	☐	34. 100 M ETHERNET
☐	☐	35. STARLAN
☐	☐	36. FDDI
☐	☐	37. LOCAL TALK
☐	☐	38. 10BASE-T
☐	☐	39. ATM
☐	☐	40. OTHER_____

A	B	COMPUTER OPERATING SYSTEM (58)
☐	☐	41. DOS
☐	☐	42. UNIX/XENIX/AIX
☐	☐	43. OS/2
☐	☐	44. OS/2.X
☐	☐	45. IBM MVS
☐	☐	46. IBM VM
☐	☐	47. DIGITAL VMS
☐	☐	48. MACINTOSH
☐	☐	49. WINDOWS
☐	☐	50. WINDOWS NT
☐	☐	51. X WINDOWS
☐	☐	52. SOLARIS
☐	☐	53. OTHER_____

☐ 54. ☐ None of the above (1-53)

8 For which areas outside of the U.S. do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4 ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

	Mainframes Installed	Mainframes Planned	Minis Installed	Minis Planned		Mainframes Installed	Mainframes Planned	Minis Installed	Minis Planned
01. IBM	☐	☐	☐	☐	06. DATA GENERAL	☐	☐	☐	☐
02. DIGITAL	☐	☐	☐	☐	07. HP	☐	☐	☐	☐
03. AMDAHL	☐	☐	☐	☐	08. TANDEM	☐	☐	☐	☐
04 AT&T	☐	☐	☐	☐	09. UNISYS	☐	☐	☐	☐
05. BULL HNIS	☐	☐	☐	☐	10. OTHER_____	☐	☐	☐	☐

Which of the following do you have installed/planned: (USE NUMBERS ONLY)

	At This Location: Servers	At This Location: Clients/Nodes	Entire Organization: Servers	Entire Organization: Clients/Nodes
11. POWER MACINTOSH				
12. MACINTOSH OTHER				
13. POWER PC BASED				
14 PENTIUM BASED				
15. 80486 BASED				
16. 80386 BASED				
17. 80286 BASED				
18. 80806/80808 BASED				
19 ALPHA BASED				
20. RISC/UNIX BASED WORKSTATIONS				
21. OTHER				

10 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

01 ☐ $100 million and over
02. ☐ $50 - $99.9 million
03. ☐ $25 - $49.9 million
04 ☐ $20 - $24.9 million
05. ☐ $10 - $19.9 million
06. ☐ $5 - $9.9 million
07. ☐ $1 - $4 9 million
08. ☐ $500,000 - $999,999
09 ☐ $499,999 or less
10 ☐ None of the above

11 Estimated gross annual revenues of your entire company/institution: (check one only)

1 ☐ Over $10 billion
2 ☐ $1 to $9 9 billion
3. ☐ $500 to $99 9 million
4 ☐ $100 to $499 9 million
5. ☐ $50 to $99 9 million
6 ☐ $10 to $49 9 million
7 ☐ $5 to $9.9 million
8 ☐ $4 9 million or less
9. ☐ None of the above

12 Estimated number of employees: At This Location/In Entire Organization.

At This Location:
1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2 500 - 4,999
4 ☐ 1,000 - 2,499
5 ☐ 500 - 999
6. ☐ 499 or less

Entire Organization:
1 ☐ Over 10,000
2. ☐ 5,000 - 9,999
3 ☐ 2,500 - 4,999
4 ☐ 1,000 - 2 499
5. ☐ 500 999
6 ☐ 499 or less

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BRIEFS

IBM has rolled out a family of **PC-to-mainframe** connectivity products designed to give users easier access to IBM mainframe and Application System/400 hosts. **Personal Communications/3270 (PC/3270)** Version 4.0, a 3270 emulation package that runs in DOS or Windows PCs, lets PCs send 3270 Systems Network Architecture traffic over asynchronous links and adds support for Hayes Microcomputer Products, Inc. modems.

PC AS/400 Version 4.0 is a new 5250 emulation package that supports all of the features of PC/3270, but adds support for the AS/400's Shared Folders feature, which allows the PC and AS/400 to more directly exchange large files.

But the most significant member of IBM's new emulation family is **PC AS/400 and 3270,** which combines the functions of both emulation packages in one user customizable program. With it users can run 3270 and AS/400 applications simultaneously on one workstation. The program supports cut and paste and other features that let users exchange data between the two environments.

PC/3270 and PC AS/400 are available for $395 and $199, respectively. PC AS/400 and 3270 is also available for $545.

IBM: (800) 342-6672.

Retix has introduced remote branch office routers and network access devices designed to inexpensively link remote users to corporate nets.

The RouterXchange 7000 RX 7100 line of **remote routers** includes two models. The RX 7102 sports one Ethernet and one T-1 link, for $1,795; the RX 7103 features one Ethernet and two T-1s, and costs $2,295. All routers are available now.

Meanwhile, the LinkXchange family of **network access devices** connects branch offices to Integrated Services Digital Network Basic Rate Interface services. They include single- and multi-user models that range in price from $1,495 to $2,995 and are available now.

Retix: (310) 828-3400.

Cisco Systems, Inc. has announced pricing for new additions to its 2500 series of **remote access routers.**

The 2505 and 2507 routing hubs are priced from $3,095 to $4,595 and $3,595 to $5,095, respectively. The 2509, 2510, 2511 and 2512 access servers are priced from $2,995 to $5,995, and the 2513, 2514 and 2515 dual port LAN and WAN devices are priced from $2,995 to $5,495.

All products will be available in October.

Cisco: (408) 526-4000.

Verilink Corp. has developed a software application that lets its **Access System 2000 (AS2000)** integrated access device act as a network testing node. The Test System 2000 can be remotely downloaded onto an AS2000 node when network troubles must be traced. The Test System is operated remotely, testing circuits and equipment near the problem area. When finished, the software is erased from the AS2000 node, which then resumes its normal functions.

Available in the middle of October, the Test System 2000 software will cost $5,600.

Verilink: (408) 945-1199.

CKS secures USAir with its NC-PASS

Airline able to set up single logon for mainframe, distributed LAN resources.

BY ELLEN MESSMER

Pittsburgh

USAir, Inc., the primary beta site for NC-PASS security software from CKS North America, has succeeded in using the mainframe application to set up a single user logon for both mainframe and distributed LAN resources.

BETA INSIGHTS

NC-PASS, which comes in one version for IBM's LAN Server and another for Novell, Inc.'s NetWare, is an IBM VTAM application that allows administrators to give users access to multiple LAN resources and MVS applications with a single logon.

USAir is evaluating NC-PASS as a way to centralize security controls governing network access for the hundreds of users in its distributed IBM Token-Ring LAN internet.

"NC-PASS lets us use the mainframe as the authentication server and simplifies administration of any changes through the single-user ID," according to Scott North, systems administrator for security at USAir.

For example, NC-PASS eases the problem of setting up the parameters for individual network use in large organizations.

NC-PASS works in tandem with access control and security products for the mainframe, such as IBM's Resource Access Control Facility (RACF) and Computer Associates International, Inc.'s ACF2 and Top-secret.

Code for NC-PASS NetWare runs on both the mainframe and the NetWare directory server. When the user logs on with an NC-PASS logon, the user identification information is sent in encrypted form to a mainframe database for verification.

NC-PASS can restrict access to specific applications until the user's identity is checked. The software can also prevent specified transactions from being completed until the user's identity is assured. It also maintains an audit trail of network activity.

LAN SERVER VERSION

The LAN Server version of NC-PASS works similarly, except NC-PASS code must also be installed on the user's personal computer. The software is available for MS-DOS, Windows and OS/2 machines.

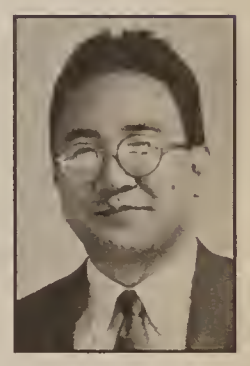
NC-PASS supports IBM's LU 6.2 session type, but by mid-1995 the company plans to add TCP/IP support, as well.

As an added security option, NC-PASS can work in conjunction with dynamic-password hardware tokens to check user authentication during logon.

A number of companies, including Security Dynamics, Inc., Racal-Milgo and Digital Pathways, Inc., offer these credit card-size hardware tokens,

See USAir, *page 24*

CKS General Manager Ralph Massaro (above) and Lloyd Tanaka, CKS' marketing manager.



HP includes token-ring remote office router with AdvanceStack

BY JIM DUFFY

Roseville, Calif.

Hewlett-Packard Co. last week rolled out a token-ring addition to its line of AdvanceStack remote site routers that features easy installation, comprehensive management and data compression.

HP's Router TFR sports one LAN and one WAN interface, which operates at speeds up to T-1/E-1.

The router supports TCP/IP, Novell, Inc. IPX, DECnet Phase IV, AppleTalk Phase 2 and Xerox Network Systems protocols, as well as Spanning Tree Learning Bridge, Translational Bridging for NETBIOS and SNA traffic, and Source Route Bridging algorithms. In addition, it supports IPX WAN Version 2, which provides interoperability between HP and Novell routers.

Features of HP's Router TFR

- "Instant-on" software to simplify installation
- Embedded Advanced Sampling Environment, which provides for network traffic analysis
- Packet-by-packet data compression
- Priced at $2,999 and available now

Wide-area interfaces include X.25, frame relay, dial-up, Switched Multimegabit Data Service and Integrated Services Digital Network. In addition, Router TFR supports Data Link Switching (DLSw) for tunneling IBM Systems Network Architecture data through IP backbones.

"Especially for the remote office, it's just idiot-proof," said John McConnell of McConnell Consulting, Inc.

But one unique feature of Router TFR is software that HP calls "instant-on." Instant-on is said to simplify installation because it automatically configures AdvanceStack routers to act as either bridges or routers from the moment they are plugged in.

Instant-on works with Network Configuration Manager, which is router configuration software that is shipped with all AdvanceStack routers, to reduce the time it takes to configure and validate router-based networks.

After configuring the router with Instant-on, users can remotely validate the configuration and manage the devices using Network Configuration Manager to alleviate the cost of staffing remote sites with trained network personnel.

Additionally, Router TFR includes HP's Embedded Advanced Sampling Environment (EASE), which provides detailed representation of network traffic without the need for special equipment such as analyzers or probes.

EASE works with HP OpenView applications, such as Traffic Monitor, to troubleshoot traffic bottlenecks and plan segment bandwidth capacity.

According to analysts, Instant-on and EASE are two features that are important for branch sites and unique to HP.

"Especially for the remote office, it's just got to be idiot-proof," said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo. "I don't think anybody else right now has any kind of embedded monitoring tools in their remote office products."

Lastly, Router TFR features packet-by-packet data compression. Its algorithm compresses and decompresses each packet instead of strings of characters, which HP claims reduces memory requirements for compression and makes it more efficient over unreliable links.

Packet-by-packet compression improves throughput by 2-to-1, HP said.

The Router TFR is available now, and the DLSw software is expected to be available Dec. 1. The router costs $2,999.

Separately, HP last week started shipping the AdvanceStack Router 650, which it announced last April. An entry-level 650 system with four Ethernet ports costs less than $12,000.

✆HP: (800) 533-1333.

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Amdahl unveils ware to monitor performance

BY JIM DUFFY

Sunnyvale, Calif.

Mainframe maker Amdahl Corp. has announced software that monitors the performance of Unix servers distributed throughout an enterprise net.

The software, called A+OpenWatch Distributed Threshold Monitor, lets systems managers survey more than 150 performance parameters against predefined thresholds so they can proactively tune the performance of client/server nets. Some of the parameters are CPU performance, job queuing and others that could help identify net and system bottlenecks. The software also includes optional links to Simple Network Management Protocol consoles so system managers can inform net managers of system faults that could impede net performance or require rerouting.

A+OpenWatch runs on Sun Microsystems, Inc. Solaris workstations and works with two other Amdahl software components: A+UMA Performance Data Manager, which runs on the servers, and A+OpenTune Performance Monitor, which runs as an application on the A+OpenWatch workstation.

A+UMA Performance Data Manager runs on Sun's Solaris and SunOS, Hewlett-Packard Co.'s HP-UX, IBM's AIX and Amdahl's UTS servers. It functions as management agent software that reviews and collects performance data, compares it against predefined thresholds and forwards alerts to A+OpenWatch should any of those thresholds be exceeded.

This performance data can then be displayed using A+OpenTune Performance Monitor, an X-client, Motif-based measurement application that drills down to the affected node to display current and historical performance metrics.

COMPONENT COMMUNICATION

Communication between the three software components is facilitated by TCP/IP socket messages. They do not use SNMP. And A+OpenWatch is only for setting thresholds and monitoring server performance; managers cannot issue remedial commands to A+UMA Performance Data Manager agents from the A+OpenWatch workstation. But, they can set up connections to SNMP consoles from A+OpenWatch and write script files that will alert those systems and invoke commands for troubleshooting faults, Amdahl said.

"We see [SNMP consoles and A+OpenWatch] as complementary as opposed to overlapping," said Richard Funnell, director of product management for enterprise management software at Amdahl.

Amdahl's software will overlap with competitive offerings from Compuware Corp.'s EcoTools applications; BMC Software, Inc.'s Patrol product for database performance management; and HP's PerfView and Performance Collection Software (PCS) for monitoring performance of distributed systems, applications and databases, Funnell said.

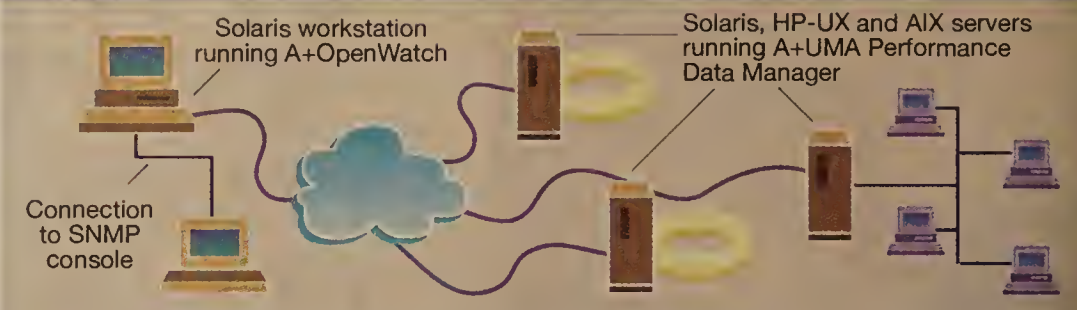
Amdahl's software complies with the Universal Measurement Architecture (UMA) blueprint for multiplatform performance data collection and management. X/Open Company, Ltd. is evaluating endorsement of UMA as a performance management standard, Amdahl said.

"[UMA] is very good from an academic perspective," said Barbara Sannerud of the Gartner Group, Inc. in Stamford, Conn. "But some people are so impatient for product that they're jumping in on alternative solutions like PCS from HP."

A+OpenWatch costs $3,500 for a single license that can monitor as many as 100 servers. A package of A+OpenWatch, A+UMA Performance Data Manager and A+OpenTune ranges in price from $21,980 to $23,220. The products are available now.

✆Amdahl: (408) 746-6000.

Performance review



Amdahl's A+OpenWatch performance management software allows systems managers to monitor the performance of as many as 100 distributed Unix servers. Optional links to SNMP consoles can notify network managers of performance degradation.

GRAPHIC BY TERRI MITCHELL

by Scott Bradner

Has it turned into soup yet?

The missing pieces of the future Internet are beginning to show up.

At the NetWorld+Interop conference, O'Reilly & Associates was finally showing off Internet In a Box, which it seems was first talked about years ago. The package, which should be on sale now, consists of a set of Internet tools: Mosaic, a news reader, support for E-mail, telnet (including remote terminal emulation) and FTP. Internet In a Box also includes instructions on how and where to get Internet access.

It's a good deal at $149 list. Unfortunately for some, it only comes for a Windows 3.1 environment. I was told that the initial run is limited to 20,000 copies because it is not definite that there are an extra 20,000 Internet spigots currently available. So it looks like bits for the masses is on the way.

On the enabling technologies front, *The Wall Street Journal* reported on Sept. 13 about a new venture called CyberCash, which is designed to "make the Internet safe for commerce." You will soon be able to safely purchase things through the Internet and charge them to a credit card or pay for them with an automatic funds transfer out of your bank account.

CyberCash brings together expertise and experience from the banking (William Melton), electronic funds transfer (Bruce Wilson), Internet (Interop's Dan Lynch) and security (Jim Bidzos and Steve Crocker) areas. Since those folks come with built-in credibility in the banking and business sectors, where the idea of using the Internet for real work might be most questioned, CyberCash may have less of a problem getting people to accept that the Internet is part of the real Information Superhighway. (Or is that the Information Superhypeway?)

The IPng draft recommendation was just published and is available on hsdndev.harvard.edu in pub/ipng/recommendation.lp for anonymous ftp and Gopher access. After much discussion within the Internet Engineering Steering Group and the IPng directorate, it was decided to make support for authentication and encryption required parts of all IPng implementations.

This has the potential of providing a secure infrastructure for a wide variety of Internet applications. An Internet key distribution structure must be created before much of the potential can be realized, and work is just starting in this area.

From the "dog that did not bark" department: The death of the federal telecommunications legislation is a mixed blessing. The bill would have increased competition in telecommunications services, which might have led to lower costs and a wider variety of products, but not without a price.

For example, making Internet service providers responsible for the content of what users could retrieve over the connection, independent of the source of the material, is a bit like making VCR manufacturers responsible for the content of the video tapes played on them. On balance, the bill's death is a plus for the Internet.

In my youth, there was a series of TV adds that consisted mostly of kids and adult males calling out, "Is it soup yet?" to dutiful mom in the kitchen. Dutiful mom was dutifully stirring a pot of semi-instant soup, and the apparent highlight of the day was when the soup was done.

As I remember it, the idea was you bought a package of soup pieces, dumped them into water and heated it until the concoction turned magically into soup.

We seem to be well on our way to collecting the box of Internet pieces, although a few are still lacking. But anyone reading com-priv can see that there is plenty of stirring going on. So it should be soup almost any day now.

Disclaimer: Over the summer, Harvard spent millions of dollars on a new kitchen to make its own soup. All of this must be mine.

➸Bradner is a consultant with Harvard University's Office of Information Technology. He can be reached via the Internet at sob@harvard.edu.

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The new AS/400 Advanced Series from IBM

USAir

Continued from page 17

which generate random passwords that change each time the user logs on. USAir also uses the dynamic-password tokens to augment NC-PASS.

Concerning USAir's network requirements, the main shortcoming of NC-PASS is that it will not yet support remote dial-in to LAN Distance, IBM's remote LAN access product.

"This is what we really need," USAir's North said.

Help is on the way on that front — a version of NC-PASS for LAN Distance is expected to be ready for beta test this November, said Lloyd Tanaka, CKS marketing manager.

CKS currently views support for IBM LAN Distance and IBM LAN Server as separate NC-PASS products, but the company may eventually bundle the two features together.

Prices for either version, which are shipping now, are set at $30,000 for 250 users, $38,000 for 500 users and $45,000 for 1,000 users. Pricing has not yet been set for the LAN Distance version.

CKS is also developing a version of NC-PASS for the AIX operating system that works under the same approach, according to Ralph Massaro, CKS general manager. The product is targeted for release the first quarter of next year.

HP sets sights on AS/400 sites

Plans to offer deep discounts on HP 9000 systems.

BY MICHAEL COONEY

Palo Alto, Calif.

Hewlett-Packard Co. has launched an assault on IBM's Application System/400, promising to deliver hardware that is faster and less expensive, has an easier application development environment and better enterprise connectivity.

Under a program known as the Open Midrange Alternative, HP will offer its Unix-based HP 9000 server platform, a complete set of application migration and transition tools, plus consulting services to AS/400 users looking to make a switch.

"We are looking to offer AS/400 users an easy way to migrate to a proven client/server platform now rather than wait for IBM to make the AS/400 more flexible," said James Yu, a product planner for HP.

HP is hanging its Open Midrange Alternative hat on the fact that recent market surveys of AS/400 users show that anywhere from 30% to 50% of them will deploy some sort of Unix-based application within the next two years. But IBM has paid attention to these figures as well and will late next year begin shipping AS/400 boxes capable of running Unix applications (*NW,* April 25, page 1).

HP has had great success getting HP 9000s into downsized IBM mainframe accounts via its Mainframe Alternative program — by some estimates, it has made more than $1 billion that way in the past few years. But analysts said HP faces a tough sell persuading AS/400 users to switch to a Unix and TCP/IP environment, largely because the business justification for such a major switch just isn't there.

"Dissatisfaction with connectivity or application development — reasons that cause most user unhappiness — just doesn't exist very often with AS/400 users," said David Andrews, president of D.H Andrews Group, a consultancy in Cheshire, Conn. "Whatever payback a user might get by moving to a Unix system would be far overshadowed by the trauma it would take to get there."

Server showdown

All transactions per minute are measured via TPC-C benchmark.

Model	Transactions per minute	Cost per transaction
HP 9000*		
T500	2,145	$973
H70	1,290	$961
E55	726	$765
IBM AS/400**		
F90	885	$3,086
F310	400	$1,923
F200	117	$1,431

* Transactions per minute are measured between server and client on TCP/IP LAN.

** Transactions per minute are measured between 5250 device and AS/400 host.

SOURCE: HEWLETT-PACKARD CO., PALO ALTO, CALIF.
GRAPHIC BY SUSAN J. CHAMPENY

HP hopes to ease such trauma by offering AS/400 application conversion tools from OpenWare Technologies, Inc. and others.

Leading AS/400 third-party software developers, such as Synon Corp., Andersen Consulting, LEGENT Corp. and Computer Associates International, Inc., are also developing software to ease the migration pain, Yu said.

COEXISTENCE CAPABILITIES

HP is also offering net coexistence capabilities, where the HP 9000 can act as a pass-through device for AS/400 5250 traffic passing over a token-ring or Ethernet LAN. The HP 9000 also supports standard 5250, tn5250 and 3270 emulation packages.

In addition, HP is offering up to 30% discounts on HP 9000 servers for users who trade in used AS/400s. HP 9000s range in price from $6,495 to more than $200,000, depending on the number of users supported.

"HP may have a small window of opportunity, but IBM has pretty much addressed most AS/400 problems, and by mid-1995, when all of the AS/400s' new hardware and software has shipped, that window will close," said Ken Sobel-Feldman, president of the Sage Associates, a consultancy in Stamford, Conn.

For its part, IBM said it will meet or beat any discount offered by HP. IBM last week ran ads in *The New York Times, The Wall Street Journal* and the *Financial Times* aimed at stomping on HP's new program. "HP's technology is 10 years old and running out of gas," an IBM official said.

✆HP: (800) 637-7740.

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INTERNET tip

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

The scoop on SNMP

The University of Twente in the Netherlands maintains a World-Wide Web (WWW) server devoted to SNMP. Resources include:

- ✔ **Answers to frequently asked SNMP questions.**
- ✔ **Copies of SNMP-related Internet RFCs.**
- ✔ **Back copies of "Simple Times," an SNMP newsletter.**

To access:
Point your WWW browser at http://snmp.cs.utwente.nl/.

Gaffin can be reached via the Internet at agaffin@world.std.com.

Companies offer remote access options

BY MICHAEL CSENGER

East Lansing, Mich.

Companies trying to extend either multi-user host-based or client/server applications to remote and mobile workers can now tailor a remote access server to their specific needs.

TechSmith Corp. last week introduced Enterprise Wide, a remote access platform optimized for client/server environments. Based on remote node technology, like many LAN access servers, it connects remote users as if they were a locally attached peer.

But while most vendors leave it at that, TechSmith has added features that optimize throughput by spoofing certain polling protocols and by providing an application program interface (API) that lets the users' applications be tied more closely to the remote access software package.

Another vendor, Xylogics, Inc., today will announce Release 9.0 of its Annex remote access family. The Annex product line has long supported remote access to IP-based LANs and to multiuser host-based systems. Release 9.0 now adds support for Novell, Inc. NetWare IPX-based networks.

Annex is unique in providing remote access to both host and LAN-based systems, said Jack O'Neil, Xylogics' vice president of marketing.

O'Neil cited a study by Forrester Research, Inc. of Cambridge, Mass., which found that nearly 60% of remote LAN access users also need access to a host environment.

"You can go through a LAN gateway to the host, but that causes twice the traffic on the LAN," he said. "It's more efficient to access the host system directly."

Xylogics' products also support Digital Equipment Corp.'s Local Area Transport protocol, and Release 9.0 allows IP and IPX users to dial out through the server, eliminating the need for additional dial-out modems on each desktop.

CLIENT/SERVER FOCUS

TechSmith, meanwhile, strives for client/server efficiency over low-speed modem links, an outgrowth of its roots as an early client/server applications developer, said William Hamilton, president and founder of the firm.

"We know something about client/server computing — how it actually gets used and what demands certain queries will put on the system," he said.

For example, most remote node applications will fetch data from the net as needed to refresh the screen. Hitting the Page Down key on a remote laptop results in a pause as the new information is retrieved over a modem link.

TechSmith tweaked its product, which requires software for the gateway personal computer and each remote client, to retrieve the next page of information while the first is still being read. "So it appears without any latency — the next screen is always there," Hamilton said.

TechSmith also developed an API that lets users tie their customized applications directly into Enterprise Wide software.

"There are a million different remote access products, and the one thing that gives TechSmith a healthy niche is the fact that you can tie your applications right into their software," said Rebecca Thompson, an analysts at Dataquest, Inc. in San Jose, Calif.

"Anyone who's gone through the effort of developing custom SQL applications is going to appreciate using this API," Thompson said.

The alternative for such users would be to load their custom applications on every remote PC or to use standard remote node software, with frustrating results.

Enterprise Wide is available now for $2,495 for four users. The system will support up to 16 simultaneous asynchronous dial-up connections.

Xylogics' Annex Release 9.0 is available as a software upgrade starting at $495. The Annex product line ranges in price from $2,290 to $14,185, depending on size and configuration.

©TechSmith: (517) 333-2100; Xylogics: (800) 225-3317.

Reality Check

Product: Enterprise Wide
Company: TechSmith Corp.

The benefits:
- Remote access server optimized for client/server connectivity.
- Protocol spoofing optimizes throughput.

A drawback:
- A specialized solution, not for standard remote LAN access.

The analyst view:
"This is a niche solution with very nice features for some client/server needs, especially customized applications. But if you're just running an off-the-shelf application, [Enterprise Wide] doesn't really gain you anything."
Rebecca Thompson

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3Com purchases NiceCom to fill the ATM niche

BY JIM DUFFY

Santa Clara, Calif.

3Com Corp. recently moved to fill in some key pieces of its High-Performance Scalable Networking (HPSN) strategy with the announcement of an agreement to acquire LAN and Asynchronous Transfer Mode switch maker NiceCom, Inc.

3Com paid $58.5 million for the start-up, which only a month ago trotted out its NiCell product line (*NW,* Aug. 22). The company, based in Lexington, Mass., will operate as a 3Com division.

The acquisition is expected to be completed this month.

3Com was attracted to NiceCom's NiCell workgroup and backbone switches, and ZipChip Application-Specific Integrated Circuit (ASIC), according to the company. The switches, one of which integrates LAN switching and ATM switching, provide an evolutionary path from shared-media LANs to high-speed ATM nets, 3Com said.

The ZipChip ASIC, which performs the Ethernet switching and ATM segmentation and reassembly in the workgroup device, will spur development of price/performance leading products, 3Com believes.

NiceCom Inc.

Based:	Lexington, Mass.; subsidiary of NiceCom Systems in Tel Aviv, Israel
Employees:	45
Primary products:	NiCell 2000 backbone ATM switch and NiCell 200 workgroup Ethernet/ATM switch
Founded:	1989 by company President Nachman Shelef

"We chose NiceCom because they had innovative technology, product available at the right time, the right design [focus] and great people," said Bob Finocchio, 3Com's executive vice president who will oversee the NiceCom division.

ATM switching in general, and ATM-stackable and backbone switches in particular, were missing links in 3Com's HPSN strategy. HPSN is 3Com's strategy to migrate users of shared-media LANs to high-speed networks by injecting ATM switching into campus and wide-area backbones, and ultimately workgroup environments.

NiceCom's NiCell 200 will fill the niche of a stackable LAN and ATM switch. It is a 12-port Ethernet switch with an optional ATM interface that can be deployed as a workgroup Ethernet switch or as a gateway to access servers on ATM networks or ATM public services.

The ATM interface can be either a 155M bit/sec Synchronous Optical Network (SONET) connection for multimode fiber or a 45M bit/sec DS3 link.

The NiCell 2000 fills the bill as 3Com's ATM switch for HPSN networks. It is a 16-port backbone matrix switch that can support more than 64,000 virtual connections. All ports support speeds of 155M bit/sec.

See **ATM niche,** *page 31*

Bull hits market with the first multiprocessor PowerPC server

BY RON CONDON

London

Groupe Bull SA has launched here the world's first servers to use multiple PowerPC processors.

The Escala systems are the result of an 18-month collaboration between the French company and IBM, which will sell its own version of the multiprocessor systems.

Escala will initially support as many as four PowerPC processors, using the AIX operating system and Bull's own symmetric multiprocessing (SMP) technology called PowerScale. Prices will begin at about $20,000, and the systems will be capable of processing as many as 1,500 transactions per second, according to the company.

As announced, the line includes five models: two minitowers, two desk-side systems and a rack-mountable version. They all use the PowerPC 601 processor, but will all be upgradable next year to the more powerful 604 and 620 when those processors become available.

Escala overcomes many of the bottlenecks associated with SMP systems. The PowerScale multiprocessor architecture has a high-speed switch, called the Data Cross-Bar, between the processors and shared memory. This channels communications between each processor and the memory, and allows each processor to access the memory subsystem directly, as if it were the only processor.

"We have listened carefully to what our customers want," said Bull Chairman and Chief Executive Officer Jean-Marie Descarpentries. "And they wanted a technology that would last as long as the application." Escala will fulfill this need into the next century with its capacity to be expanded and upgraded, he said.

Bull expects the launch of Escala to help it reach its goal of being the top-selling vendor of Unix systems in Europe by 1996, according to Couder. That market share is currently at 5%.

Descarpentries, who took up his post last October, predicted that Bull would halt its long string of losses and become profitable by the middle of 1995. Revenues were up 11% in the first half of 1994, compared with the same period last year, while nonsalary costs were down from 39% to 31% of revenues, he said.

Orders for Unix-based systems were up 30% on last year, according to Alain Couder, president of the open systems and software division of Bull. "We expect the launch of Escala to accelerate this trend," he said, adding that Bull aimed to be the top-selling vendor of Unix systems in Europe by 1996. The company's current market share of the commercial European Unix market is 5%.

To back up these ambitions, Couder relaunched Bull's reseller program under the Powerful Advantage banner, with the aim of increasing the proportion of systems going through third parties from its current 18% level to 30% by 1996. The company is also encouraging software companies to port to the SMP version of AIX under its Flying Start program.

Couder added that OEM deals, such as one under which Motorola, Inc. has adopted the PowerScale technology, would also boost Bull's business.

➡ Condon is London correspondent for IDG News Service.

BRIEFS

Sunsoft, Inc. of Mountain View, Calif., this week at Unix Expo will announce Solaris 2.4, an update to its **Unix operating system** that synchronizes the Intel Corp. and scalable processor architecture (SPARC) implementations. This version provides full multithreaded multiprocessing support for Intel-based platforms, and most hardware can run it unmodified.

Solaris 4.2 for SPARC systems will be available this week. Sun expects to deploy it on SPARC platforms later this year.

Sunsoft: (415) 960-3200.

Artisoft, Inc. of Tucson, Ariz., this week will roll out a new 32-bit implementation of its LANtastic network operating system (NOS) for **IBM's OS/2 3.0.**

The newest version of Artisoft's peer-to-peer NOS will enable LANtastic users to communicate with one another across OS/2, DOS and Windows systems, said Eric Small, program management director at the company. Users also have a gateway into the Unix and Windows NT environments through LANtastic for TCP/IP and Server Message Block servers. LANtastic for OS/2 users can also connect to IBM LAN Server and Microsoft Corp.'s Windows for Workgroups and Windows NT.

LANtastic for OS/2 is a native implementation that follows all OS/2 conventions, including support for a multithreaded client, a graphical appearance and long file names. Its security is the same as in other current versions of LANtastic, including both individual and group accounts, and Access Control Lists to specify account privileges and access rights.

Artisoft: (602) 670-7100.

Hewlett-Packard Co. this week will announce a price decrease of as much as 25% on its line of **100VG-AnyLAN adapter cards** that can operate at either 10M or 100M bit/sec. The prices of the 10/100VG Selectable Industry Standard Architecture (ISA) and Extended ISA LAN Adapters are now $349 and $449, respectively.

HP: (800) 533-1333.

Pricing for standard 10M bit/sec adapters continues to fall. **National Semiconductor Corp.** has dropped the cost of its **10Base-T InfoMover NE2000plus Ethernet adapters** by more than 25% from a list price of $87 to $63 each when purchased in 20-pack quantities. In 100-pack quantities, the per-adapter price is $61.

National: (800) 227-1817.

Fore Systems, Inc. has announced its ForeThought Partners Program, which is designed to accelerate the deployment of **Asynchronous Transfer Mode** technology and ensure net interoperability. Through the program, Fore will make its ForeThought internetworking software available to qualified hardware and software vendors, as well as university and research institutions. The software supports all current ATM standards, including User-to-Network Interface 3.0, Q.2931 signaling and the draft standard for LAN emulation.

Members of the program include Allied Telesis, Inc., Cabletron Systems, Inc., Concurrent Computer Corp., Cray Research, Inc., Georgia State University, NetEdge Systems, Inc., Optical Data Systems, Inc., Rice University, Tricord Systems, Inc. and the University of Kentucky.

Fore: (412) 772-6600.

Hughes LAN Systems, Inc. has rolled out a suite of new services designed to assist network managers in evaluating, modeling and troubleshooting their net environments. The new LAN Care service includes installation of **Remote Monitoring Lan Probes** from Hewlett-Packard Co. that will monitor LAN segments under analysis. That information is then uploaded to Hughes' LAN Care Center where experts organize and analyze the data, as well as prepare a series of reports, including net profiles, segment utilization, potential problem areas and suggested solutions. The service will be available in November. Pricing starts at $9,500.

Hughes: (800) 395-5267.

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ISA Plug-n-Play Compliant	X	X	X	
Multilevel Security Features	X	X	X	X
Asset tracking	X	X	X	
PC tattooing	X	X	X	
Optional Desktop Management Software	X	X		
Bi-directional parallel port	X	X	X	X
Desktop Management Interface (DMI)[3]	X	X		

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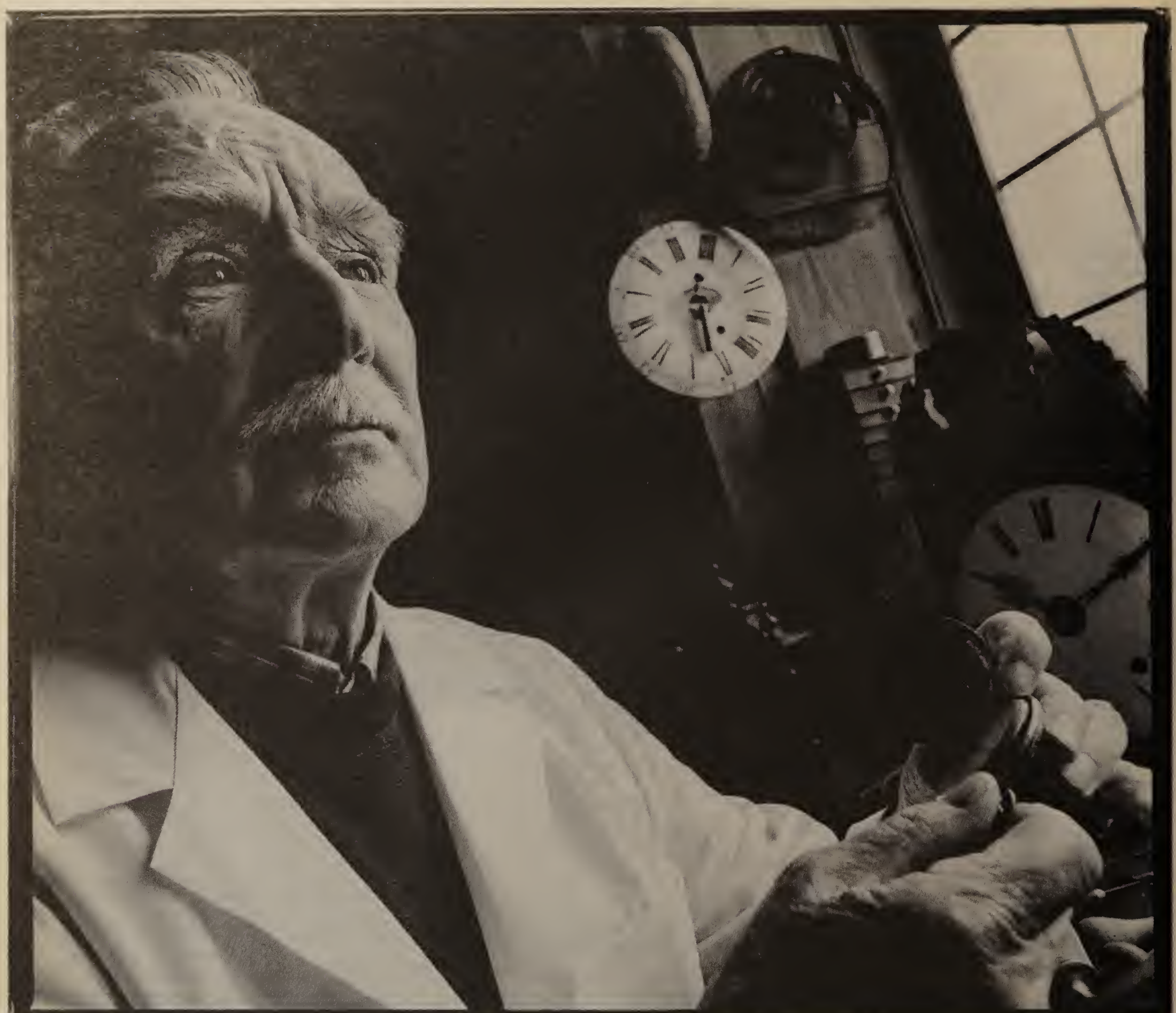

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WINDOWS CONNECTIVITY

Many vendors throwing their weight behind Windows NT 3.5

BY PEGGY WATT

Dallas

A variety of vendors piggybacked on Microsoft Corp.'s recent Windows NT 3.5 and BackOffice announcement with related product introductions, including new net management, Application System/400 connectivity and WAN integration offerings.

■ **Network Managers, Inc.** of North Chelmsford, Mass., extended its Simple Network Management Protocol-based net management system to work with Microsoft's new Systems Management Server (SMS), Windows NT Server 3.5-based software due to ship in November. This will enable users to conduct systems and net management from a central console. Network Managers' NMC 4000 Network Manager tracks data flow around the network, monitoring servers, hubs, routers and other devices.

LES WOLLAM

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"We offer the global view of net management, not simply workgroup management," said Michael Emanuel, vice president of marketing at the company.

The link to SMS, formerly known as Hermes, will strengthen Network Managers' workgroup and desktop management abilities. SMS will enable users to track desktop-based software and conduct other desktop management chores.

Pricing will be announced when the package ships later this year.

Network Managers: (508) 251-4111.

■ **Andrew Corp.** of Orland Park, Ill., plans to ship next month a version of its Emerald Client AS/400 connectivity product that supports Microsoft's Windows NT-based SNA Server gateway.

The Emerald Client for Microsoft SNA Server, priced at $245, is a 32-bit 5250 emulator and file-transfer system. It enables a workstation to access applications and data on an AS/400 through an SNA Server.

Andrew: (708) 349-3300.

■ **Eicon Technology Corp.** of Montreal has announced that it is supporting Microsoft's BackOffice package — Windows NT bundled with SNA Server, SQL Server, SMS and Microsoft Mail — with a new version of its WAN Services for Windows NT.

The product extends the Windows NT TCP/IP stack over WANs via X.25, frame relay, the Point-to-Point Protocol and ISDN. It also can extend SMS' management reach.

Eicon Technology's WAN Services for Windows NT is now shipping and costs $393. The product runs with the firm's line of EiconCards, which range from $1,195 to $1,695.

Eicon Technology: (514) 631-2592.

■ **Sybase, Inc.** of Emeryville, Calif., next month will ship a version of SQL Server System 10 for Windows NT and announce pricing at that time. (Microsoft's implementation of SQL Server is Version 4.21a and is developed separately). Sybase is also developing a Windows NT version of its Gain Momentum 3.0, a multimedia authoring tool set. The $4,995 product synchronizes video, audio and animation, and uses object-oriented technologies for multimedia development.

Sybase: (510) 596-3500.

■ **Comshare, Inc.** of Ann Arbor, Mich., is shipping a Windows NT 3.5 version of its Commander EIS executive information system and is developing a client/server version that will feature a Windows 3.1 client desktop and Windows NT multidimensional server.

Pricing for an entry-level package begins at $85,000 for a single server and 25 client versions.

Comshare: (800) 922-7979.

ATM niche

Continued from page 27

3Com will begin offering these and other ATM products early next year. The other products will include ATM modules for 3Com's LinkBuilder hub, ATM interfaces for its LANplex 6000 backbone LAN switches and NetBuilder II routers, and ATM adapters for servers and workstations.

Analysts said the NiceCom purchase makes sense for 3Com, but hurdles lie ahead.

"They've got to start to cohesively bring all this technology together that they're purchasing," according to John DePietro, WAN analyst at International Data Corp. in Framingham, Mass. "That's their next big step."

✆3Com: (408) 764-5000.

Windows Connectivity Forum

Backing up BackOffice and chatting up Windows

By Joel Diamond
Technical director
WUGNET
Windows User Group Network
76702.1023@CompuServe.com

First of all, the Windows Connectivity Forum (WINCON) is up and running and active.

Hundreds of files have been posted on a variety of Windows networking issues. Also on the forum are public domain shareware packages and timely articles.

Hot topics of discussion include the Intel Corp. and Microsoft Corp. Telephony Application Programming Interface, surviving NetWorld+Interop 94, Microsoft's NT File System Developers' Conference, Lotus Development Corp.'s Notes and the World-Wide Web, the latest Microsoft Mail bug fix, BackOffice and Novell, Inc.'s SuperNOS, among others.

HEARD IN THE BACKOFFICE

You've likley heard by now of the Windows NT 3.5 and related BackOffice announcements Microsoft at last month's Windows World/Networks Expo in Dallas. But if you weren't there, you may not realize that Microsoft Chief Executive Officer Bill Gates followed up his keynote address with an informal user meeting.

Gates predicted that Microsoft's server business — Windows NT Advanced Server and its BackOffice suite — will grow by 50% annually over the next two years. That, he said, will outstrip growth of any other part of Microsoft's business. Then again, at last fall's Comdex show, Gates said he expected Microsoft's new consumer division to account for the highest growth areas for 1994 to 1996.

As bold as his predications are, Microsoft has to:

- Have the field marketing support components in place to compete with other server/networking firms.
- Put the right value-added reseller strategy in place with existing Solution Partners, authorized hardware resellers and others.
- Successfully reposition the Microsoft technical support service organization to support an estimated $1 billion-a-year server business.
- Convince customers to utilize an evaluation cycle as short as six months for migrating existing backbone nets to the new BackOffice architecture.
- Convert its experience with bundling desktop applications in suites to bundling server applications in suites.

Surely there are other issues, too. Drop by message section 8 HOT TOPICS and let us know if Microsoft's "suite" new sales approach will make you a potential customer of BackOffice.

CHATTING UP WINDOWS

Having been an overextended Windows-based Internet user for the past nine months, there's one Internet feature that I have yet to find time to explore: Internet Relay Chat (IRC).

IRC, which features a WinSock TCP/IP connection, is basically a part of Unix that lets users converse in real time. If you or your coworkers are interested in examining this feature, WINCON's Internet/WinSock library contains several applets that make interactive chatting a point-and-click option. The WINCON sysops will let you know what software is available to support this. For those already familiar with IRC over a remote WinSock dial connection, come and share your first hand experiences.

PICK OF THE WEEK

Our pick of the week happens to be an IRC-compliant software package from Crosswise Corp., which has uploaded to WINCON an exclusive demo of its new cross-platform document conferencing product, Face to Face 2.0 Listener edition. The company claims that its software is the first such offering to support both Windows and Macintosh users.

The software is designed to let networked users simultaneously view documents created with a variety of applications, guide one another with electronic pointers and make annotations using a simple set of drawing tools — all while talking on the phone. Version 2.0 of the conferencing software lets users review and annotate documents together in real time over most common network connections, such as dial-up lines, ISDN, AppleTalk, IPX/SPX and TCP/IP. The software requires no special hardware or cabling.

Crosswise has uploaded Face to Face 2.0 Listener for Windows (F2FWIN.EXE) or Macintosh (F2FMAC.SEA) to WINCON's Desktop Conferencing Library 20. After installing the demo package, call Crosswise at any time, and someone there will connect you to the firm's First Meeting Service. The Face to Face 2.0 Listener edition will also allow you to conduct a meeting with any user of the standard Face to Face package. The demo version's primary limitation is that it can be used only to receive a call from a remote Face to Face user; it cannot initiate a call itself.

Alantec goes GUI for hub mgmt. tools

BY SKIP MACASKILL

Atlanta

Alantec Corp. has shored up its weakest area with the rollout of a network management application to configure, monitor and control its line of PowerHub intelligent switching hubs.

PowerSight is the company's first graphical user interface-based management application. It improves on Alantec's existing command-line interface features via in-band telnet and out-of-band ASCII connections.

"For the first time, I can get a graphical look at the environment our two PowerHubs support," said Jim Littlefield, a PowerSight beta user and senior network administrator at Microtec Research in Santa Clara, Calif. "It also allows me to look at long-term performance statistics that I simply didn't have access to before this release."

Based on NetLabs, Inc.'s fourth-generation language-based Vision net management software, PowerSight allows users to configure bridging and routing parameters, as well as virtual LAN workgroups.

It also provides a graphical representation of PowerHub's front panel, enabling users to click on a specific port or module and access a variety of management and traffic data via an imbedded Simple Network Management Protocol agent. That information can then be graphically displayed in report form.

The Unix-based application provides a full suite of bandwidth management tools that allow users to view bandwidth utilization on one segment or between two segments. Users can also set thresholds based on the information that will automatically send an alarm if exceeded.

It can also be used in conjunction with the PowerHub's port monitoring feature that enables users to troubleshoot, analyze and monitor multiple Ethernet and Fiber Distributed Data Interface segments using a single network analyzer. Via PowerSight, users can switch the analyzer from segment to segment via software, eliminating the need to physically move the analyzer to capture packets.

PowerSight can run as a stand-alone Unix application on IBM RISC System/6000, Sun Microsystems, Inc. SPARCstation or Hewlett-Packard Co. HP 9000 workstations, or run on top of several network management platforms, including HP OpenView, IBM NetView/6000, NetLabs DiMONS and SunSoft, Inc. SunNet Manager.

Available now for $4,995, PowerSight 1.0 will initially support the PowerHub 3000 and 5000 lines. Support for the PowerHub 7000 will be available in the fourth quarter.

✆Alantec: (800) 252-6832.

Photonics airs wireless adapters

BY BOB BROWN

San Jose, Calif.

Photonics Corp. has extended its infrared light-based wireless LAN product line with two new personal computer adapter cards as well as a pair of connectivity offerings for giving wireless users access to wire-based Ethernets.

The company's products enable users to exchange data with one another on a peer-to-peer basis or access net resources at 1M bit/sec by bouncing infrared light off walls, ceilings and other surfaces in rooms up to 25 by 25 feet.

The new adapters are called Collaborative Port and Collaborative microPCMCIA.

Collaborative Port, designed for both desktop and portable computers, consists of a parallel port adapter and an external infrared transceiver. Collaborative microPCMCIA is a PCMCIA card equipped with an integrated infrared transceiver and designed for notebook computers.

Photonics has designed the new adapters with network drivers compatible with assorted Novell, Inc. NetWare nets as well as with network operating systems from Artisoft, Inc., IBM and Microsoft Corp.

The company already sells an Industry Standard Architecture (ISA)/Extended ISA card with an external transceiver for desktop computers called Collaborative PC as well as a PCMCIA-based adapter with an external transceiver dubbed Collaborative PCMCIA.

MAKING CONNECTIONS

The new connectivity products are called Collaborative EtherPoint and Collaborative EtherPoint Kit.

Collaborative EtherPoint is a network-attachable Intel Corp. 80386-based device that provides a bridge between Photonics users and wire-based Ethernets.

The dedicated device comes preconfigured with an Ethernet adapter, a Collaborative PC adapter and software.

The Collaborative EtherPoint Kit is simply a software package for designing a Collaborative EtherPoint-like device. Users can employ the kit to make a computer into a dedicated or part-time wireless-to-wire connectivity system.

Among the early users of the new offerings is W.L. Gore & Associates, Inc., the maker of GORE-TEX material in Newark, Del. The company has been using Photonics Collaborative PC adapters and the Collaborative EtherPoint Kit for about a month, initially to let users at three workstations on its factory floor here input production data to a server on an Ethernet LAN via a wireless connection.

The company is using direct line-of-site connections between the workstations and the Collaborative EtherPoint workstation, given that the ceilings in its factory are too high to bounce the signals off, said Peter Lutz, W.L. Gore's LAN administrator.

The technology is working fine so far and has enabled the company to get around the problem of hard-wiring workstations in an environment where work spaces often change, according to Lutz

✆Photonics: (408) 955-7930.

The Photonics file

Product	Price	Availability
Collaborative Port	$495	November
Collaborative microPCMCIA	$595	Now
Collaborative EtherPoint	$895	Now
Collaborative EtherPoint Kit	$129	Now

GRAPHIC BY TERRI MITCHELL

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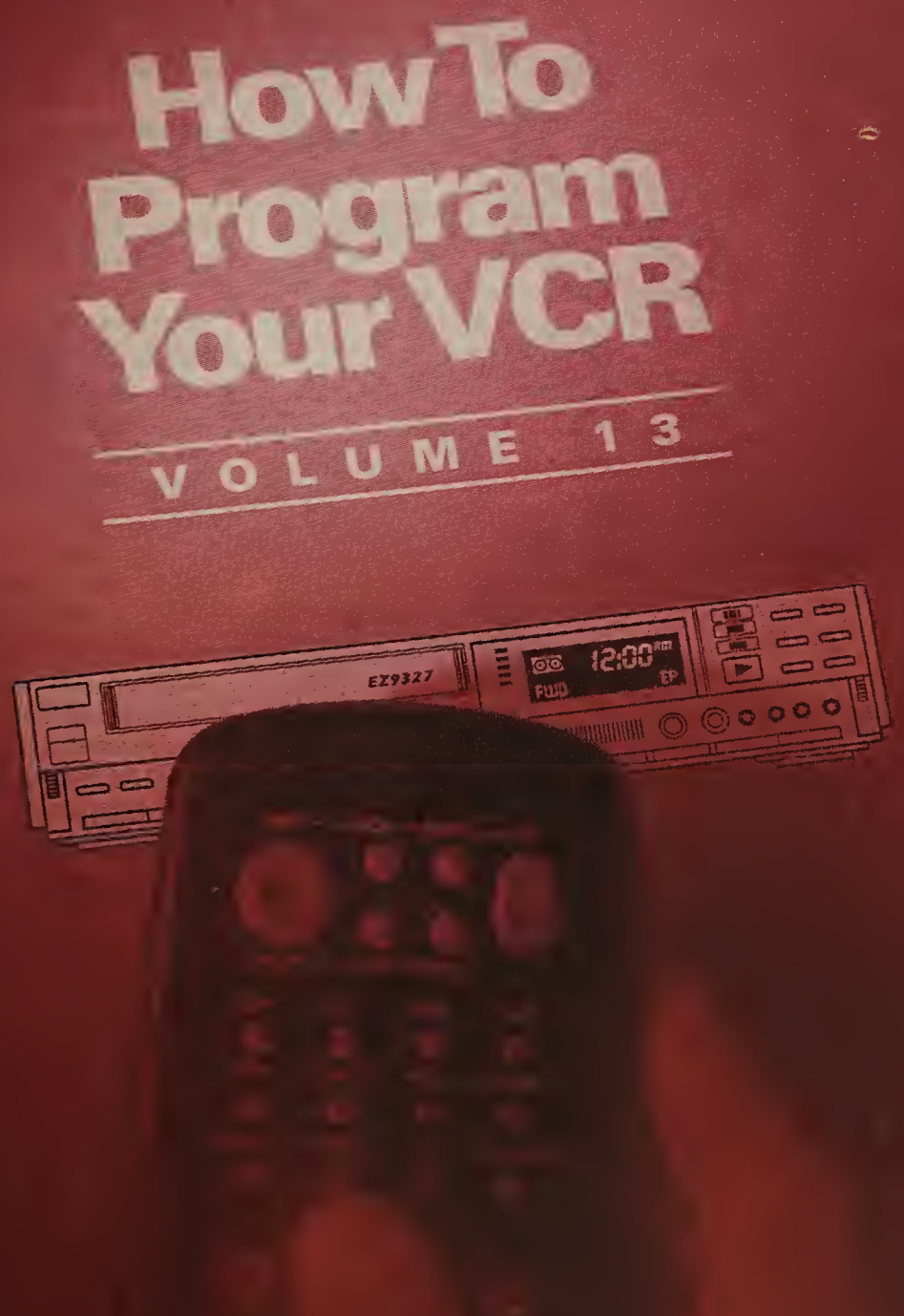

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by Mark Gibbs

Theories of networking

One of my favorite theories (not actually mine, but one I read in *Omni* magazine's wonderful Journal of Irreproducible Results) is that if an infinite number of rednecks in an infinite number of pickup trucks shot an infinite number of shotguns at an infinite number of road signs, they'd eventually create all of the world's great literature in braille.

Here at the Gibbs Think Tank and Tropical Fish Emporium, we have a few theories of our own concerning networking.

The first is that a technical support group's load is never less than the square of the number of users minus one divided by their average competence on the Gibbs scale.

The highest level of competency on the Gibbs scale is 1. This is a theoretical level indicating complete competency found only in people with a genius level IQ and (at least according to them) newly graduated computer science majors. The lowest level is 0, one that is far too common, particularly among CIOs.

The upshot of this formula is that support can never be made easier by making end users more competent.

Now you might be asking, "What's the justification in using the square of the number of users?" Others of you might ask, "And why 'minus one'?"

The answer is that two users can create a load on the technical support group in four different ways: the first user only can have a problem, the second user only can have a problem or both users can have a problem. That they have no problem is the remaining state, which of course never happens, and hence we subtract one.

All of this discussion about user competence leads me to another theory, which has a potential payback.

As users always fall flat on their faces and cats always land on their feet, strapping a cat to a user's back should result in the interesting sight of users, when they make a mistake, hovering a few feet above the ground and spinning madly.

If this theory proves true, as we believe it will, then we could harness the rotational force of the spinning users to generators and power the PCs of the users who haven't yet made a mistake.

The larger the user population and the greater their incompetence, the greater the potential power generation capability. Indeed, with enough incompetent users, you should find yourself in the profitable situation of being able to sell your excess power back to the electricity company.

Yet another theory from the Gibbs Think Tank suggests that there is an interesting consequence of our voracious consumption of hard disk space.

We add millions of disk drives to our computers every year. Most of these drives are in the Northern Hemisphere and most rotate counterclockwise.

The result is that all of these drives, due to minor flaws in the drive's bearings, tend to precess very slightly (that means wobble to all who passed on Physics 101). When enough disk drives are in circulation — we estimate that to be by the year 2010 — the combined wobbles will be powerful enough to effect the Earth and knock us out of orbit.

We shall wander in space like a giant Nerf ball, never sure where we're going or when we'll get to wherever it is that we'll wind up. Actually, that will be pretty much business as usual...but I digress.

So to further the pursuit of knowledge, I am pleased to announce the *Network World* Theory Competition. If you have a theory about networking, computers or related technologies, E-mail your entry to me. If you are communicationally disadvantaged, you can also write on some stuff called paper and send it to me via the *NW* offices. Entries are due by Nov. 7.

The winner will receive a prize of inestimable value — a sweatshirt bearing the inscription "Winner of the Gibbs Think Tank Theory Competition and Intolerable Know-it-all, *Network World* 1994" signed by myself and the editors.

Gibbs is a consultant and writer in Ventura, Calif. He can be reached at (800) 622-1108, Ext. 504, or on the Internet at mgibbs@rain.org.

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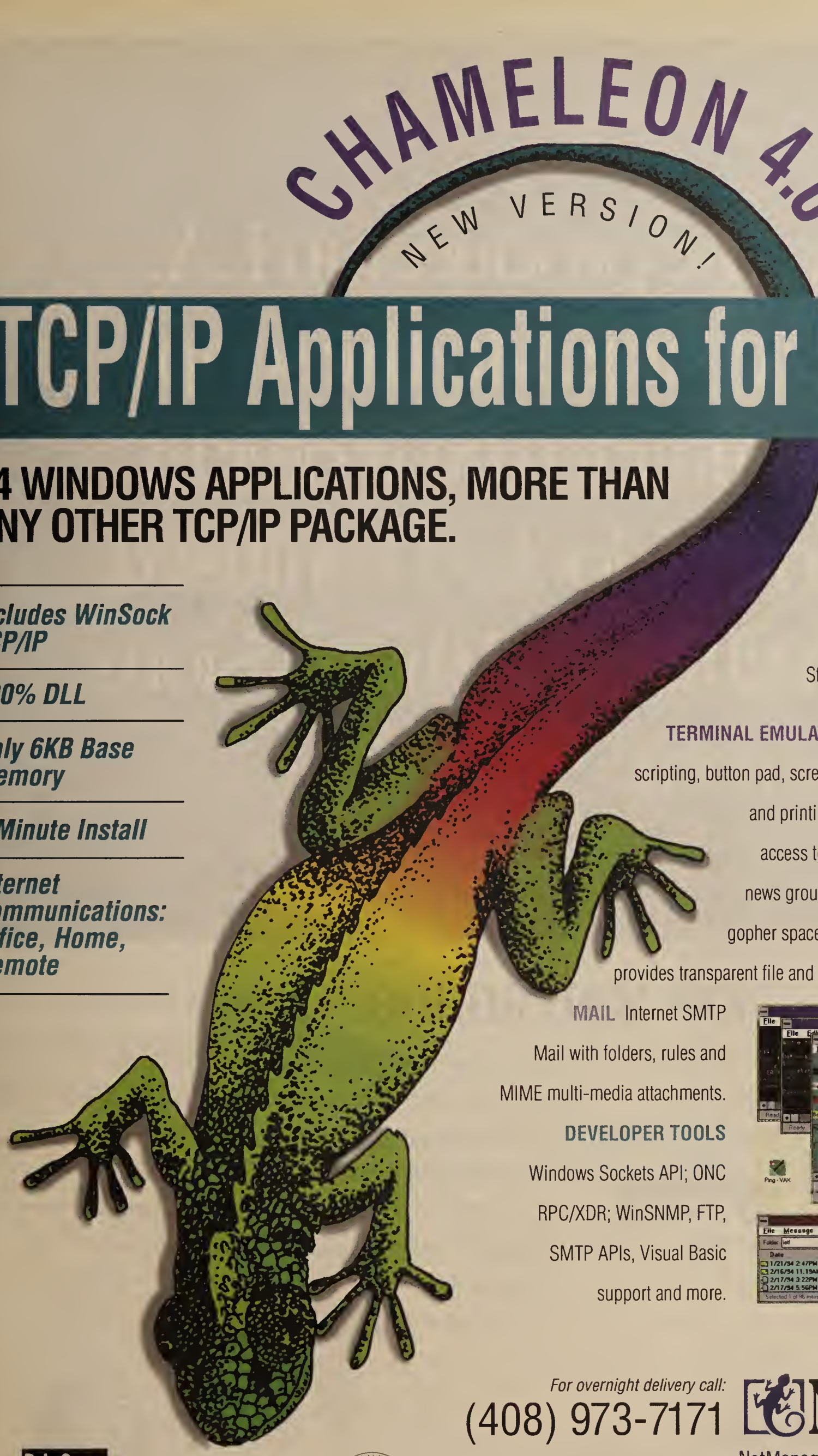

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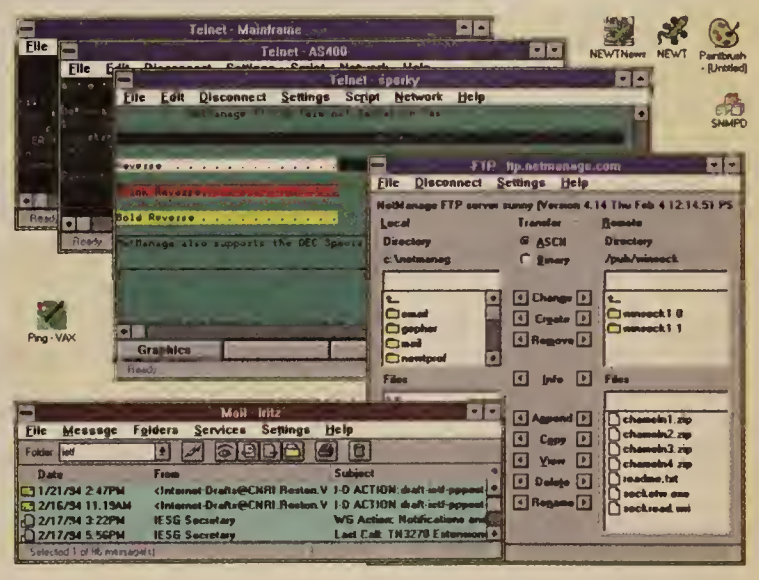

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AT&T gets integrated message mgmt. rolling

To deliver PC-based voice mail interface at show.

BY JOANIE WEXLER

San Diego

AT&T intends to fulfill some of its integrated mailbox promises this week at the Tele-Communications Association, Inc. conference and exhibition here.

The firm's Global Business Communications Systems Group said it will start taking orders for a Windows-based client interface to its Intuity multimedia messaging server. Intuity, announced in January, aims to allow users to blend different message formats in one mailbox and eliminate the need for multiple servers to accommodate them (*NW*, Jan. 17, page 19).

The new interface, called Message Manager, will allow users to click on personal computer icons to retrieve voice mail — and later, other types of messages — in the order and format of their choice.

AT&T also said it will announce that the new Intuity software, Version 3.2, is available for its Merlin Legend Communications System for smaller businesses. Intuity currently links only to AT&T Definity switches and those from other vendors, such as Northern Telecom, Inc. and Rolm.

The Intuity unified mailbox is scheduled to accommodate fax next quarter and, in the future, electronic mail and video messages.

Intuity currently combines voice mail and voice response, and has, until now, supported just a telephone interface.

TCA '94

"Improving the efficiency and range of interface options is important," explained Donald Larson, director of information technology and services at Kraft General Foods, Inc., an Intuity shop in Northfield, Ill. "It's not efficient for everyone to use a touch-tone interface."

He said unified messaging management will soon become more important in his locale as Environmental Protection Agency mandates for telecommuting kick in, and home work forces struggle to access multiple message for-

See **Message mgmt.**, *page 38*

Software agents give call centers new Agility

BY DAVID ROHDE

San Diego

Call center managers today will get a new way to access and update enterprise network databases while letting callers shuttle effortlessly between live agents and interactive voice response (IVR) systems.

At the Tele-Communications Association show here, Aspect Telecommunications Corp. will unveil a new integrated applications module called Agility for its flagship Aspect CallCenter automatic call distributor (ACD) system.

Key to the Agility module, which sits on Ethernet LANs, are software agents that walk callers through access and entry of data using IVR and provide that data to human agents through screen pops.

Each module supports as many as 50 agents. The number of agents required depends on call volume and anticipated complexity of applications employed.

The agents can interact with databases throughout the network while handing off or taking back data from live agents in the call center. They work with most major database software, from older IBM IMS to Oracle Corp. and Sybase, Inc. databases.

In this fashion, users sidestep the problem of "information leaks" inherent in typical computer telephone links, according to Ben Kiker, Agility product manager.

Information obtained during a call, whether via touch-tone entries or live operator queries, remains with the session no matter how often the call is switched between live and automatic interaction, or shipped between different applications, Kiker said.

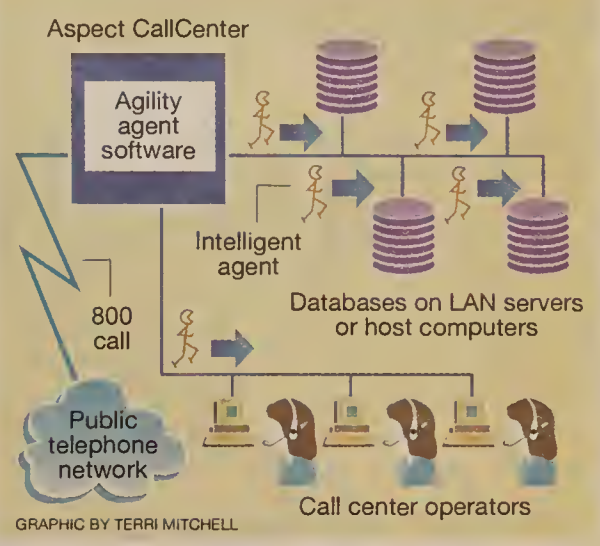
And at the end of a call, the Agility Agents can deposit new stores of information into a database, such as the identity of the live agent who handled the call.

Thus, users interested in skills-based routing of

See **Agility**, *page 40*

Self-service

Aspect Agility agents can retrieve data and deliver it to callers via interactive voice response or pop it onto human operators' screens.



GRAPHIC BY TERRI MITCHELL

800 SERVICE

MCI unveils plans for one-number call forwarding

BY BILL BURCH

Washington, D.C.

Getting a head start on rival service providers, MCI Communications Corp. last week announced plans to launch DirectlineMCI, a national call-forwarding service for voice and fax calls.

Scheduled to go live the first week of December, DirectlineMCI will give all end users their own 800 numbers. Incoming calls will be routed to three numbers in sequence — a user's office, cellular and home phones, for instance. Calls can be forwarded to both domestic and international numbers.

While the call makes its rounds, a caller on hold is updated about the call's progress. If a called party does not answer, the call can either go to voice mail or to an outside paging service.

The service also supports a fax store-and-forward function that allows a user to arrange for fax delivery to a remote machine. Callers can also attach a voice annotation to a fax message.

MCI has not put a price on the service yet, but monthly charges could be higher than those for similar services from other carriers. MCI plans to sell the call-forwarding, fax and voice mail services as a group at a flat monthly rate, according to Neil Hediger, a senior manager of brand marketing with MCI.

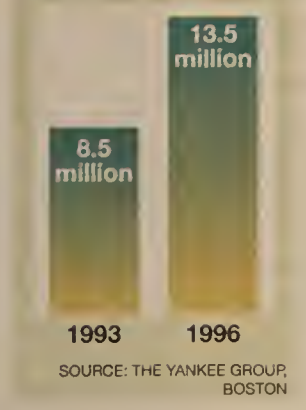
In addition to the flat fee, users will also have to pay the freight on incoming calls to their 800 number and will be responsible for call-forwarding charges.

Users can add DirectlineMCI billings to their overall MCI bill to earn volume discounts. However, MCI has not yet decided whether customers can purchase 800 service for DirectlineMCI at negotiated rates.

The idea of a one-number service that forwards calls is not new. MCI's service resembles earlier "follow-me" services offered by regional Bell holding companies' cellular subsidiaries.

Telecommuting bonanza

Number of home offices



SOURCE: THE YANKEE GROUP, BOSTON

Ameritech Cellular Services offers a service that allows customers to route calls to business, cellular or home phones, as well as receive faxes. The service, which does not support store-and-forward fax reception, is priced at $14.95 to $19.95 per month.

BellSouth Cellular Corp. has its Pro-Link One-Number Service, which also offers call forwarding and includes a fax store-and-forward service.

MCI's DirectlineMCI service reportedly improves on those services by offering national coverage. The service's December launch

See **Call forwarding**, *page 42*

BRIEFS

BellSouth Corp. has won federal court approval to provide cable television services to residents in Vestavia Hills, Ala. The decision could open the way for cable competition in BellSouth's nine-state territory.

US WEST Marketing Resources last week announced GOtv, an **interactive entertainment and information service.** GOtv services will include movies provided by such US WEST partners as Fox Television Stations, Inc., Paramount Pictures Corp., MCA, Inc. and MGM/UA Communications Co. GOtv will launch in a 4,000-customer market trial in Orlando, Fla., via US WEST and partner Time-Warner Co.'s network in the spring of 1995.

GTE Personal Communications Services has begun offering national **paging** services, including messaging, alongside its cellular voice and data services. Users will eventually be able to receive **one monthly bill** for all four wireless services, the company said.

GTE: (404) 391-8000.

In other wireless developments: **Ameritech Cellular Services** turned on its **Cellular Digital Packet Data (CDPD)** service in the Chicago area. Also, **AT&T, Motorola, Inc.** and **Northern Telecom, Inc.** said they will deliver products based on **Code Division Multiple Access (CDMA)** — a high-capacity digital cellular scheme — for personal communications services by early 1995, while CDMA patent holder **Qualcomm, Inc.** introduced an 8-ounce CDMA-based phone, which is expected to ship in mid-1995. **Nextel Communications, Inc.**, which last week said it has signed a letter of intent to purchase **American Mobile Systems, Inc.** by year end, has also turned on the digital upgrade to its specialized mobile radio net throughout **California**. The system combines cellular, two-way dispatch, alpha paging and text messaging in one handset.

NASA satellite is flying high in the Ka-band spectrum

BY ELLEN MESSMER

Washington, D.C.

A year after its launch into orbit, NASA's experimental Advanced Technology Communications Satellite (ACTS) is living up to its promise, pioneering a new kind of flexible, high-bandwidth wireless communications.

ACTS is the first satellite using the 30-GHz Ka-band spectrum. It has proven it can dynamically deliver digital voice, data and video to fixed and mobile positions at up to T-1 speed. This month, the satellite will be tested at speeds from 155M to 622M bit/sec at sites ranging from the Mayo Clinic to The Boeing Co.

The Mayo Clinic, along with Huntington National Bank, Southern California Edison Co., Jet Propulsion Laboratory and the Army, just completed the first round of transmission tests at T-1 and lower rates using Ka-band very small aperture terminals by Harris Corp.

"We were originally skeptical, but this has worked very well," said Dr. Bijoy Khandheria, a cardiologist who presented an overview of the Mayo Clinic's three-month ACTS project during a recent Satellite Communications Users Conference here.

The U.S. military has also found ACTS to work well — so well, in fact, that the Army transported a number of the Harris VSATs to Haiti for overseas communication during Operation Uphold Democracy, said sources close to the U.S. Army's Space Command.

The Mayo Clinic's project involved connecting a Native American Indian reservation in Pine Ridge, S.D., with the Mayo Clinic's Washasha, Minn., hospital for remote diagnosis of patients. The Harris VSAT was connected to telemedicine equipment, such as an electronic stethoscope, real-time ultrasound and remote dialysis monitoring machines. It supported transfer of sound and images at up to T-1 speeds on an as-needed basis.

The Mayo Clinic now uses a standard satellite uplink to connect its three hospital sites across the country. But it is eager to investigate long-term use of Ka-band service, particularly because the equipment is expected to be much cheaper than those for C- or Ku-band.

Facts about ACTS

Builder: Martin Marietta Astrospace for NASA

Users: Huntington National Bank; American Express Co.; Southern California Edison; U.S. Army; Ohio University; Jet Propulsion Laboratory; The Mayo Clinic; and Georgetown University School of Medicine.

September 1993	ACTS is launched.
September 1994	First T-1 tests completed.
October 1994	Tests of 155M bit/sec to 622M bit/sec will begin.
1997	Expected completion of user testing.

GRAPHIC BY SUSAN J. CHAMPENY

The Harris Ka-band VSAT, for instance, will cost about $1,000 each. "At that price, we'll buy a dozen of them," Khandheria said.

This month's tests of the 155M to 622M bit/sec satellite service will get under way once Bolt Beranek and Newman, Inc. delivers the necessary 3.4-meter high-bandwidth satellite terminals it is building. "We are going to be doing ATM at 155M to 622M bit/sec by the end of the year," Khandheria said.

ACTS is an experimental satellite, however, and similar commercial services are not expected for at least two years.

Message mgmt.

Continued from page 37

mats, phone numbers and addresses.

Larson added that to be more useful, Intuity should play in other server environments. "AT&T needs to build alliances with others," he said.

The Electronic Messaging Association has recently begun work on industrywide consolidation of mailboxes, but it is not yet clear how vendors' own schemes, such as Intuity, would play into that effort.

Other Intuity 3.2 enhancements include:

- Call accounting for tracking private branch exchange activity.
- The capability for the caller to leave priority messages.
- Automatic paging for message notification.
- Multilingual abilities.

An average Message Manager implementation for Definity and other PBXs is about $35 per user for a 200-user system, AT&T said, plus a onetime $950 charge to link the Intuity server to the customer's LAN.

Pricing for an Intuity system for the Merlin Legend starts at $16,500.

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Circle Reader Service #33

ATM demo shows promise for health care

Nationwide collaborative network also exposes technology weak spots.

BY JOANIE WEXLER

Washington, D.C.

A recent demonstration to Congress and the Clinton administration of collaborative health care applications reflected the lifesaving promise of the Information Superhighway while exposing some rough spots in ATM congestion and rate control schemes.

The Healthcare Working Group of the National Information Infrastructure Testbed (NIIT) late last month fired up real-time multimedia exchanges of patient records, X-rays, magnetic resonance images (MRI) and other diagnostic data among physicians from the University of Southern California (USC) School of Medicine in Los Angeles and Johns Hopkins Medical Center in Baltimore.

The health care providers consulted on a hypothetical car accident victim's case, and the activity filtered through a demo site here, where Information Superhighway enthusiasts could observe.

The NIIT is a year-old group of corporations, universities and government agencies working to develop a national information infrastructure. Its health care demonstration used a combination of SynOptics Communications, Inc. Asynchronous Transfer Mode LAN switches, dedicated T-3 links from AT&T and MFS Communications Company, Inc., satellite, and ATM services from Pacific Bell and WilTel to help diagnose and treat the "patient" (see graphic).

Participating doctors said that without the palette of information delivered by the network, they might have done an unnecessarily invasive operation on the patient and administered medication to which she was allergic.

The project's champion, Dr. Edward Chow, task manager at Jet Propulsion Labs and research associate professor for the USC School of Medicine, said the demo was encouraging from the perspective of enhancing health care quality through networks.

However, he explained that it brought to light some soft spots in ATM technology: weak flow control and delay management schemes.

The ATM Forum is still working on a standard way to throttle down from higher to lower speeds — in this case, from USC's 155M bit/sec ATM LANs to the 10M bit/sec permanent virtual circuit (PVC) that Pacific Bell reserved for USC in the demo. Knowing he needed 2.5M bit/sec for video and some extra for data files, Chow thought 10M bit/sec would be adequate.

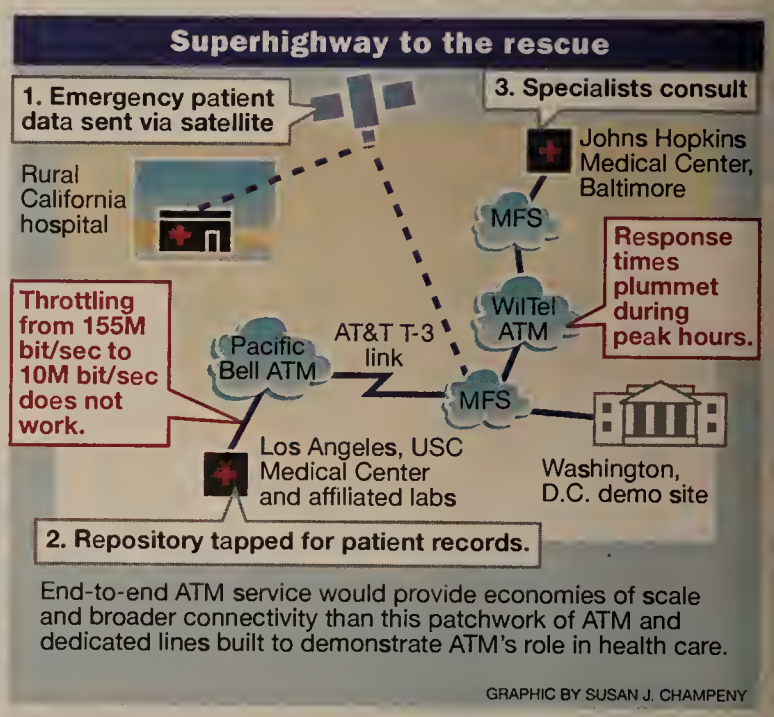
But, he said, except for very small files — 270 bytes and under — the configuration did not work because Pacific Bell's ATM switch from Newbridge Networks, Inc. did not have large enough input buffers.

To solve the LAN-to-public service throttling problem, he increased the Pacific Bell PVC link to nearly 155M bit/sec. But he faced the downshift issue again as traffic moved off Pacific Bell's net to AT&T's dedicated 45M bit/sec link to Washington, D.C.

Nonetheless, big switch buffers are not an ideal answer for two reasons, said Chow. When downshifting from 155M to 45M bit/sec, for every bit sent, two were buffered. At that rate, "you can't build a buffer big enough to keep cells from falling on the floor," he added.

Chow said this is a problem for any transmission with no intermediate flow control, such as fast-packet technologies, but is particularly thorny with ATM because of its high — potentially gigabit-per-second — speeds.

Ultimately, Chow put a 45M bit/sec ceiling on the traffic that exited USC LANs to solve the problem.



End-to-end ATM service would provide economies of scale and broader connectivity than this patchwork of ATM and dedicated lines built to demonstrate ATM's role in health care.

GRAPHIC BY SUSAN J. CHAMPENY

Another problem caused by big buffers is unpredictable delays. The 45M bit/sec WilTel ATM network between Washington, D.C. and Baltimore saw the round-trip acknowledgment process jump from 2 to 12 msec during busy times of the day.

The reason is WilTel's NEC America, Inc. switch has a 2,000-cell buffer that keeps cells from being dropped — but slows response.

"A six-times increase would be unacceptable in many applications," Chow said.

Agility

Continued from page 37

calls can take the concept one step further by giving the Aspect ACD the ability to search first for the exact agent who successfully dealt with the caller the previous time, Kiker said. Airlines have expressed interest in this for their most frequent flyers, he said.

The Agility system gave beta user Claris Corp., a Macintosh and Windows software support house in Santa Clara, Calif., new marketing flexibility, said Jeff Swanson, director of information services.

At Claris, customer data is stored in a Sybase database housed in a Digital Equipment Corp. VAX computer. To provide caller data to technical support agents as the 800 calls came in, Swanson used to run a serial link between the Aspect CallCenter and the VAX through an RS-232 connection.

But the firm wanted to offer free and paid software support under various plans, including monthly, minute-based or incident-based plans. The existing ACD-host link could not handle the chargeback required to callers' accounts for such a variety of plans.

Chrysler Corp. is testing Agility in its Systems Network Architecture environment, enabling its 6,000 dealers to call into an Aspect CallCenter to obtain information on automobile service contracts.

The Agility software agents verify the five-digit dealer codes on one of Chrysler's IBM mainframes via 3270 terminal emulation over Synchronous Data Link Control lines. Dealers can check on claim status and, for trade-in vehicles, obtain information on the remaining value of the contract and how settlement will be made with the car owner. "From a hardware/software standpoint, it's been purring like a kitten," said David Knuth, Chrysler telecommunications operations specialist.

An entry-level configuration, with a single module including 10 software agents, eight voice ports and management support, costs about $70,000. A configuration with six modules containing 250 agents, 240 voice ports and three development stations costs $650,000. General availability is slated for early 1995.

✆Aspect: (800) 541-7799.

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Circle Reader Service #37

Rolm sets Dec. ship date for PBX supporting Microsoft spec

BY DAVID ROHDE

Santa Clara, Calif.

Rolm has became the first major telecommunications equipment manufacturer to set a shipping date for a PBX that supports Microsoft Corp.'s computer-telephony application program interface.

The company said it will begin including Microsoft's Telephony API (TAPI) as a standard feature on its popular 9751 CBX telephone system in December.

Support for TAPI, which is widely used by independent software vendors (ISV), is expected to help users move from rudimentary computer-telephone integration (CTI) capabilities, such as point-and-click call control, to more advanced applications, such as remote database access from call control programs.

Rolm hopes applications written by ISVs to TAPI will dovetail with its ComManager product, which allows users to control telephony functions from a personal computer screen.

"It sounds like something I'd want," said Mary Savage, manager of corporate telecommunications at GE Capital Mortgage, the Raleigh, N.C.-based mortgage insurance division of General Electric Corp.

Currently, about 40 employees of GE Capital Mortgage have ComManager, allowing them to point and click to initiate calls and control voice mail features, Savage explained.

But if employees need to call a list of mortgage lenders that have failed to update delinquent mortgage reports, for example, they must obtain a printout of such lenders from a database and manually enter the names into the ComManager program, she said.

With applications that are being developed for TAPI, these employees could initiate a database query, receive the names and telephone numbers automatically, then click on names in sequence to initiate calls, according to Savage.

Technically, such applications are possible using Rolm's proprietary API, CallBridge for Desktops, said Francisco Kattan, Rolm's manager of workplace products. But the wide universe of Microsoft developers is expected to come out with a broader and more usable range of applications since TAPI is eventually expected to be installed in most major private branch exchange systems, he said.

AHEAD OF NOVELL

Significantly, Rolm is bringing out its TAPI driver earlier than its intended driver for Novell, Inc.'s Telephony Services API (TSAPI), which links PBXs and NetWare servers rather than telephones and Windows PCs.

Kattan said the widely accepted Microsoft TAPI interface will allow in-house programmers at user organizations to develop their own custom applications. For example, Stylus Innovation, Inc. in Cambridge, Mass., is working with Rolm to create TAPI programming tools for Visual Basic programmers.

Given that there are more than 1.2 million Visual Basic programmers, a large number of custom or off-the-shelf CTI applications could be developed for Rolm desktops, said Michael Cassidy, president of Stylus Innovation.

By contrast, few PBX manufacturers have shipped drivers for TSAPI. A notable exception is AT&T (*NW*, July 18, page 23).

Nevertheless, Rolm reaffirmed its commitment announced last March to TSAPI and said it will bring out a driver next year.

✆Rolm: (408) 492-2000.

Call forwarding

Continued from page 37

should mean that MCI is among the first with a national one-number service.

Fellow local and long-distance carriers are currently working on one-number services that rely on the companies' Advanced Intelligent Network (AIN) databases. Those services will use a new 500 area code to route calls to the AIN databases for call forwarding.

DirectlineMCI is similar to the 500 service Hediger admits. MCI may actually wind up using the AIN databases to provide local access to DirectlineMCI, he said, a move that could cut the service's price.

MCI's launch of a national one-number service can be seen as an early raid on the one number market. With long-distance rates fairly close, carriers are always looking for ways to distinguish themselves, said Adam Reeves, an analyst with the telecommunications group at Dataquest, Inc. in San Jose, Calif.

The convenience of one-number service does not guarantee product success, according to Mark Langner, a senior consultant with Tele Choice, Inc. in Verona, N.J.

"Does anybody remember [AT&T's] Easy Reach 700?" Langner asked. "That's been on the market for a couple of years, and I've yet to run across somebody who uses it." ◪

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RATE & TARIFF MONITOR

by Eric Paulak

Virtual nets go integrated, yield big discounts

Virtual private networks were first introduced in 1985 by AT&T, with its Software-Defined Network (SDN), as a cheaper alternative to traditional private lines.

Since that time, MCI Communications Corp. has come out with its Vnet virtual network and Sprint Corp. its VPN. They've all been immensely popular and successful, except for the fact that they are only good for outbound dialing; they don't offer 800 inbound service.

That's now changing, at least with some of the carriers. Sprint announced its Premiere service earlier this year, and AT&T last week released its OneNet option for SDN. With these services, you can now get bundled inbound and outbound services under one package, which allows you to take advantage of larger volume discounts.

A little history: Previously, the only integrated inbound and outbound packages that included a virtual network used to be several of AT&T's Tariff 12 options. But they weren't convenient because they had a set list of features and services unique to individual customers and nothing else.

Then along came AT&T's contract tariffs and MCI's Specialized Customer Arrangements for midsize to large customers. The drawback there was they had to be negotiated, unless you happened to latch on to a deal that someone else inked, and you signed the same deal within a 90-day period.

But now, Sprint and AT&T have brought bundled deals into the standard tariffs, making them available for anyone who meets the minimum revenue requirements.

With Sprint's Premiere service, which replaced its VPN, you can get peak-time inbound 800 service for as little as $.162 a minute with dedicated access and $.227 for switched access.

Premiere's designed for companies that do at least $30,000 a month in inbound and outbound traffic. But in order to qualify for volume discounts, you have to do at least $60,000 per month — $30,000 each for inbound and outbound. At that level, you can get an 8% to 12% discount on both inbound and outbound calls, depending on how many years you commit for. Sign a five-year deal for $200,000 a month and you can get a 34% discount for inbound calls and a 35% discount for outbound.

Under AT&T's OneNet option for SDN, customers qualify for discounts based on their total outbound SDN usage, as well as for inbound 800 Readyline or Megacom 800 service.

With a combined inbound/outbound commitment of $50,000 per month, outbound services net a discount of 27% to 29% for domestic service and 15% to 17% for international depending on the term of the deal. Actual outbound rates vary depending on whether you use switched or dedicated access.

Inbound 800 discounts under the same commitment level range from 22% to 24% off o standard 800 Readyline Megacom 800 rates again depending on the term of the commitment. Megacom 800's standard rates are $.167 to $.2022 per minute, and 800 Readyline's rate are $.2667 to $.2845 per minute, both depending on mileage.

With the OneNet discounts, Megacom 800' rates drop to as low as $.1273 per minute with a five-year commitment; 800 Readyline rate drop to as low as $.2027 per minute with th same five-year commitment. If you were to g with Megacom 800 or 800 Readyline separatel from the OneNet Option, the largest discount you could get are 12% and 15%, respectively.

If you already have AT&T's or Sprint's vir tual network service and one of their 800 ser vices, you should dump the separate service and go with their bundled offerings. Not onl do you get bigger volume discounts, but yo also get the convenience of one bill — some thing you can't get with a contract tariff or on of AT&T's Tariff 12 options.

Paulak is associate publisher for the Center fo Communications Management Information i Rockville, Md., a provider of rate an tariff information. He can be reached a (301) 816-8950, Ext. 32

Users express frustration over new low-end Notes

BY ADAM GAFFIN

Cambridge, Mass.

The David Geffen Co. was all set to buy Lotus Development Corp.'s new low-end groupware client software — Notes Express — for the 200 employees of its Geffen Records division three weeks ago. But things have changed.

When Geffen Records officials learned that the software would not run any of the Notes applications previously developed by the company's information systems department, the company began installing Microsoft Mail instead. Geffen Records now plans to look at Microsoft Corp.'s planned Exchange Server for its future groupware applications.

Although some users are hailing the low-cost Notes Express (*NW*, Sept. 19, page 5), others are blasting Lotus for releasing software that cannot use most applications developed in Notes. For $100 a copy when bought in volume, Notes Express gives users access to five relatively simple template applications, as well as Notes' replication and security features. This compares to $330 to $495 a copy for full-fledged Notes, which adds a variety of development and administration tools, as well as the ability to run workflow and other sophisticated applications.

Users take Notes

Since its introduction in 1989, some 900,000 licenses for Notes have been sold.

Many users, such as Geffen, were looking for a run-time version of Notes, in which a team of developers could build sophisticated applications and then roll them out across an enterprise, connecting end users with no need for development or administration tools.

Geffen Records, currently installing its first enterprise network, had hoped to use Notes as both a universal electronic mail backbone and a platform for desktop and collaborative applications, according to James Griffin, a Geffen executive who oversees information

See **Notes**, *page 48*

BRIEFS

Expersoft Corp. of San Diego last week announced an agreement to integrate its XShell **object request broker** with **Object Design, Inc.**'s ObjectStore database. The goal of the integration is to create a single system for distribution and management of application objects across a distributed object network.

Expersoft: (619) 546-4100.

Trinzic Corp. of Palo Alto, Calif., recently unveiled a new version of its **database replication** and routing software. InfoPump 1.2 will have a 32-bit implementation for OS/2, AIX and Windows NT, and links to databases from Computer Associates, Inc., IBM (DB2/6000) and Informix Software, Inc.

The new version of InfoPump is expected to ship for OS/2 during the fourth quarter, with Windows NT and AIX versions planned to ship in the first quarter of next year. Pricing will start at $25,000 for OS/2 and Windows NT, and $35,000 for AIX.

Trinzic: (415) 328-9595.

PeopleSoft, Inc. of Walnut Creek, Calif., recently announced a **purchasing module** for its PeopleSoft Financials client/server application software. The new module incorporates a variety of design and security features for supporting such functions as purchase order generation, item and vendor maintenance, and sourcing. The software can be integrated with other PeopleSoft Financials modules, such as accounts payable. The software runs on Gupta Corp. SQLBase and Oracle Corp. Oracle7 databases, and supports Windows clients. Additional databases will be added by year end.

Pricing starts at $100,000.

PeopleSoft: (510) 946-9460.

Novadigm, Inc. of Mahwah, N.J., last week said it will work with **PowerSoft Corp.** to integrate its Enterprise Desktop Management (EDM) application deployment software with PowerSoft's PowerBuilder application development tool kit.

Novadigm: (201) 512-1000.

TI composing revised apps strategy

New system will feature a Windows NT-based repository.

BY ADAM GAFFIN

Plano, Texas

Texas Instruments, Inc. last week announced a new name and features for its enterprise application development tool kit, which is being transformed from a proprietary mainframe-based system to a client/server-based system.

Composer, formerly known as the Information Engineering Facility, will gain middleware from PeerLogic, Inc. to connect clients, hosts and servers, plus a new graphical interface for partitioning applications across clients and servers. It will ship in November.

The development tool kit will also feature a Windows NT-base repository that will let developers build and store business objects for creation of enterprise applications.

Other enhancements in Composer will let developers add support for transaction processing monitors, including Novell, Inc.'s Tuxedo, to their applications. They will also be able to give clients the ability to access several back-end databases simultaneously and to route them to backup servers when their primary servers go down.

Because Composer supports a variety of hosts, servers and communications protocols, the repository could provide the link between Windows NT nets and the enterprise, TI officials said. Integration of PeerLogic's Pipes middleware strengthens this by letting developers build applications without worrying about the requirements of the underlying networking protocols.

Other new tools include browsers for selecting and viewing data

See **TI strategy**, *page 49*

IBM to add visual front ends to tools

IBM will announce this week graphical user interface (GUI)-based versions of its C++ and COBOL application development languages that it promises will improve developers' productivity on legacy and client/server applications.

This will bring to six the number of IBM development tools to which it has added a GUI front end. Visual interfaces make the tools, traditionally used in mainframe- and minicomputer-based nets, easier and more likely to be used in mixed host and client/server nets, said Eric Bush, manager of enterprisewide application development strategy at IBM.

The revised COBOL and C++ tools will share the same front end as IBM's VisualAge tool.

Customers have invested much time and money training developers to use languages such as COBOL and have a huge investment in applications built in those languages, Bush said. Giving them the ability to use GUI-based programming shortcuts will encourage customers to protect their investments while migrating to client/server systems, he said.

The COBOL product, to be called VisualCOBOL, will add such capabilities as creating objects linked by common methods and inheritance, Bush said. It will, however, still be able to generate straight COBOL applications without object technology. The C++ product, which is as-yet unnamed, will be based on IBM's existing Cset++ product and will be a similar object-capable hybrid. Both tools will run on OS/2, AIX and, eventually, Windows clients. The tools will function with IBM's LAN-based application development repository, Team Connection (*NW*, Sept. 26, page 1). IBM has not yet announced pricing or availability information.

IBM: (800) 426-2255.

BY KEVIN FOGARTY

Focus to target downsized apps on parallel processors

BY BARB COLE

New York

Information Builders, Inc. (IBI) next week will roll out a version of its application development tool that lets users build applications that take advantage of parallel processing computers.

Focus 4GL for Open Environments lets users build client/server applications that exploit Unix-based symmetrical multiprocessing (SMP) computers, the company said. Such applications produce queries that may access a Focus database in parallel, delivering increased throughput for large-scale applications.

Focus 4GL for Open Environments also has many new back-end interfaces, including those for databases from Informix Software, Inc., Oracle Corp. and Sybase, Inc.

The new version also includes data migration tools that let users import information from Focus applications running on mainframes, according to the firm.

"This product will provide a strong mainframe downsizing path for the company's existing base of Focus [mainframe database] users because parallel processing machines can support large-scale applications," said Chet Geschickter, vice president and director of research at Hurwitz Consulting, Inc., a market research firm in Watertown, Mass.

Users said Focus for Open Environments would enable them to downsize to SMP or massively parallel processing machines for less money than migrating to databases from Oracle or Sybase, for instance.

"We had Focus running in the IBM mainframe environment and we've moved to an SMP system from Pyramid. This tool will let us write applications that perform faster," said John Mertz, vice president of Integretel, Inc., a billing a collection service for telephone companies in San Jose, Calif. Mertz's applications typically have multiple data paths that must be queried separately. "My understanding is that we'll be able to acccess multiple paths simultaneously."

Focus 4GL for Open Environments will be available in the first quarter of 1995 for Sun Microsystems, Inc., IBM, AT&T Global Information Solutions (GIS) and Pyramid Technology Corp. Unix-based systems. Pricing is user-based and will range from $1,895 for a single user to approximately $140,000 for 128 users.

©IBI: (212) 736-4433.

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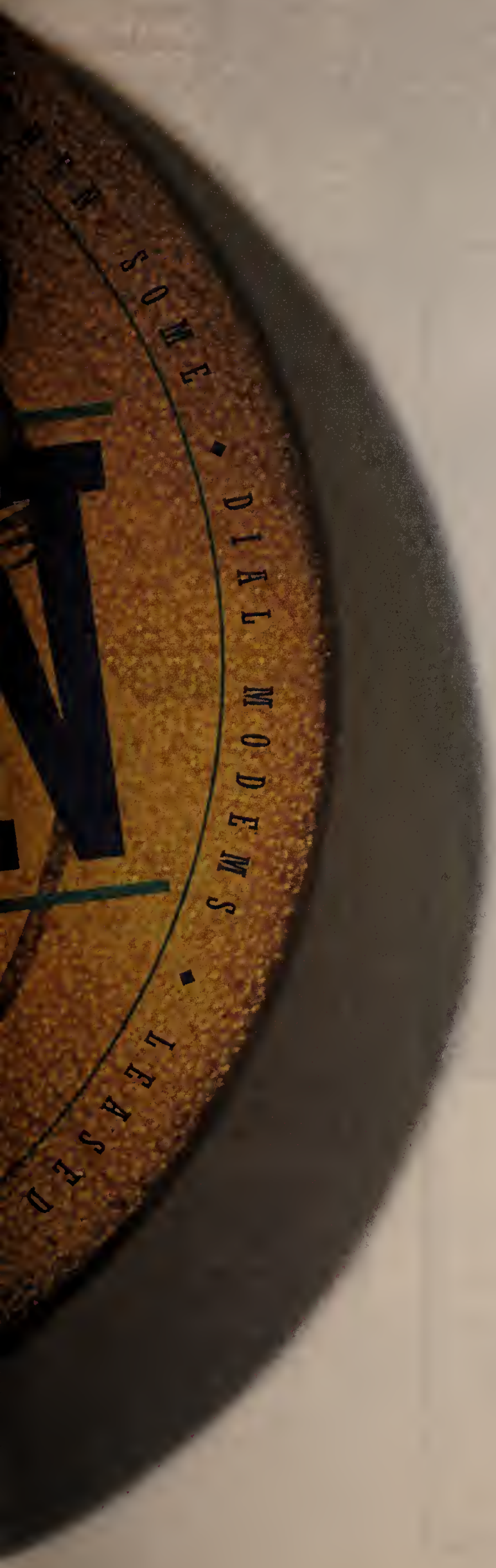

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COLLABORATIVE COMPUTING

IBM positions middleware at the heart of its groupware strategy

BY KEVIN FOGARTY

IBM has quietly begun assembling a challenger to Lotus Development Corp.'s Notes based on its MQSeries message-oriented middleware.

MQSeries will provide a backbone for IBM's UltiMail client/server electronic mail product as well as for an enterprisewide implementation of its groupware product suite.

IBM plans to compete with Lotus on Notes — which it currently resells — by integrating a number of its products that provide functions similar to some of those found in Notes, said Richard Sullivan, director of workgroup solutions for IBM's Software Solutions division.

WHAT'S INCLUDED

The as-yet-unnamed integrated groupware product set will include the FlowMark workflow product, the Visual Document Manager document management system, the Time and Place/2 group scheduler, and it may possibly come with the Person to Person group conferencing product.

It will also include the IntelliAgent desktop personal information manager, which can provide E-mail filtering, personal calendaring and some workflow capabilities.

UltiMail 2.0, due during the first quarter of next year, will run on a slimmed-down version of MQSeries, which itself works like E-mail.

MQSeries stores and forwards action calls and data between applications.

Through MQSeries, the groupware applications will be able to send complex messages to each other with the assurance they will be delivered immediately or stored in a queue until MQSeries is able to deliver them. That will provide extra security that E-mail-linked groupware applications often lack, said Mike Rothman, an analyst at the consultancy Meta Group, Inc. in Reston, Va.

"If you could get OEMs to develop on top of it, it could be good. The only danger now is that IBM won't deliver what it promised," Rothman said.

MQSeries — which runs on OS/400 and OS/2, and will eventually run on AIX — still supports too few platforms and applications to make it widely appealing, according to Rothman.

"If you could get OEMs to develop on top of it, it could be good," Rothman said. "The only danger now is that IBM won't deliver what it promised."

INTERNET *tip*

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

Browsing the World-Wide Web (WWW)

Although the Mosaic browser has quickly become associated with the WWW, you do not need this software to take advantage of the fast-growing information resource. Many Internet providers now offer users access to Lynx, a character-based interface very similar to Gopher. Lynx lets you:

- ✔ **Use the WWW's hyperlinks to information resources.**
- ✔ **Download many on-line images.**
- ✔ **Create a "bookmark" list for easy access to favorite services.**

To access: At your access provider's command prompt, type lynx and hit Enter. Or use telnet to connect to sunsite.unc.edu and log on as lynx (you cannot set up bookmarks on this server, however).

Gaffin can be reached via the Internet at agaffin@world.std.com.

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Envisioned by Mr. Ray Noorda, former president and chief executive officer of Novell, and led by Elaine Bond, a recognized leader in the banking industry and former senior vice president at Chase Manhattan Bank, the OURS membership includes information technology users, vendors, and service providers from a wide range of industries including banking, education, electronics, manufacturing, financial services, forestry, food processing, government, insurance, legal, transportation, telecommunications, and utilities.

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- cultivate relationships with current and prospective customers
- develop partnerships and strategic alliances

OURS Fosters Solutions

OURS is solution-oriented. Its members work together to identify issues, draw findings, make recommendations, and develop action plans that serve as a framework for the successful deployment, management, and support of multivendor enterprise information systems.

OURS Is a Commitment

Members meet at OURS workshops twice yearly, while task forces hold additional working sessions between workshops. Most members commit an average of two hours per month to OURS. Some task force members opt for leadership roles, while others prefer to participate in a supportive role. Either way, OURS represents a mutual commitment to achieve success.

- User-driven . . . OURS is committed to its user members, who serve as catalysts for research and drive task forces, special committees, and meetings.
- Solution-oriented . . . OURS is committed to working together to tackle real-world issues and develop solutions that will benefit the entire information technology industry.
- Vendor/Service Provider-Friendly . . . OURS is committed to communicating feasible requirements to vendors and service providers in a fair and open fashion.
- Synergetic . . . OURS is committed to the spirit of continuous cooperation and synergy between users, vendors, and service providers.

OURS Strengthens IT Management

OURS is committed to helping its members contain the cost of information technology, while justifying the investments required to support the necessary infrastructures. Accordingly, members of OURS develop policies, guidelines, and methodologies that foster effective financial and technology management practices, with a continuous emphasis on managing cultural and organizational change.

OURS Is a Valuable Resource

OURS task forces concentrate on important and pressing matters. Each task force is charged with the responsibility to deliver written findings, opinions and recommendations in *OURS Information Technology White Papers*, which provide action plans and methods for dealing with critical issues. These documents substantiate and justify user investments and management strategies, and influence industry-wide change.

PREFACE

The following White Paper Report is a synopsis of the Software License Task Force's observations in the areas of software licensing problems, metrics for software service, license model selection criteria, choosing the best license model and defining a lexicon of definitions to provide vendors, service providers, and end users with a common ground to facilitate software licensing transactions.

For information about membership or OURS task forces and work products contact:

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Executive Overview

At the first annual meeting of the Open User Recommended Solutions Consortium in 1992, the participants identified the area of software licensing as being one of three key areas that warranted immediate attention. The OURS Software Licensing Task Force was formed to sift through the myriad of symptoms. Through the collective experiences of their members, the Task Force was able to dig beneath the layer of manifestations and discover some common themes.

This initial work led to the identification of four Software Licensing Problem Scenarios. These are:

1. the proliferation of personal software use in the enterprise;
2. the consolidation of data centers or processing functions;
3. the migration to networked computing architectures; and
4. outsourcing, mergers, and acquisitions.

If the Task Force had stopped here, the work would still have been useful. However, the nagging question remained — everyone is already complaining about these problems, what are we going to *do* about them? Around the table were representatives of customer companies and vendor companies. These people negotiated and managed billions of dollars worth of software transactions every year. During these sessions, the members began to propose guiding principles that they felt should apply equally well to both sides. The ideal was to be willing to be the licensee or the licensor without hesitation. One newcomer to the Task Force made an interesting observation during a break — since he did not know anyone yet, he could not tell who were the customers and who were the vendors!

The Software Licensing Task Force identified five principles during the many working sessions. They constituted the foundation for the rest of the White Paper. These principles are:

1. Software pricing must be fair to both the vendor and the customer.
2. The perceived value of software is user-specific.
3. Value is a function of risks and benefits over time.
4. Software service is an adequate basis for a software licensing model.
5. Appropriate software service metrics depend on the type of software.

Much of the discussion focused on the fact that traditional licensing models (and the price they determined) did not predict value very well. As a result, the Task Force developed several ways for vendors and customers to objectively measure value. Since perceived value is user-specific, tradeoffs exist in selecting the most useful metrics for any given situation. This led to the creation of a methodology to assist customers through the evaluation and resolution of these tradeoffs.

Although no single answer to the software licensing problems we face, this White Paper presents a road map to arrive at better license models for both vendors and customers.

Both parties to software licenses must take positive steps to cause the desired change. Customers need to sort out their values pertaining to different categories of software and investigate the issues surrounding the automation of license management. Vendors need to offer creative license models that better reflect perceived value and develop methods of cost-effective software management. By stimulating the discussion between software vendors and their customers, these software licensing principles and models address the problems faced by the industry.

The Open User Recommended Solutions task forces are all co-chaired by at least one representative each from a customer company and a vendor company. The Software Licensing Task Force is indebted to Chase Manhattan Bank and Software AG. Their leadership and work ethic were a stabilizing force. They guided the Task Force from inception through the development of the first version of the Software Licensing Principles and Glossary in March of 1993. Since that time, the Software Licensing Lexicon has replaced the preliminary Glossary and the Task Force is currently addressing the business practices surrounding the licensor-licensee relationship. We look forward to sharing that work in the near future and fostering a healthy debate to keep the software industry vital.

The OURS Software Licensing Task Force has been co-chaired by Software AG of North America, Inc.,
Motorola, Chase Manhattan Bank, N.A.
X/Open companies whose representatives contributed to this document:
Gradient Technologies
Hewlett-Packard
Santa Cruz Operation

Table 1: Significant Events in Computing and Software

Event	1960s	1970s	1980s	1990s
Price per MIPS	$250,000	$100,000	$23,000	$1,000
Hardware architecture	mainframe hosts	minicomputers	personal computers/ workstations	networked systems
User interfaces *	data center operators	limited distribution terminals	10% to 59% use PCs	60% to 85% use PCs
Networked * desktops	nonexistent	nonexistent	2% to 39%	40% to 70%
Application architecture	host-based batch processes	host-based interactive processes	Host/Mini cooperative processes	LAN-based distributed processes
Software implementation	procedural languages	specification languages	Custom Modules	object libraries
Software users*	10% of workforce	20%	35%	60%
Software role	computational	operational efficiency	decision support information access	autonomous decision making
Perceived software value	quantified cost item	———	———	——>strategic asset

* Numerical data for USA only.

The Changing World of Computing

The New Mission

The world of computing has changed so dramatically since the creation of conventional software license models that it needs new license models. The mission of information processing and the available technology to accomplish that mission have developed together in a collaborative partnership. Ambitious business objectives have lead to software advances which, in turn, have inspired yet more complex and creative business applications. Hardware vendors have remained ahead of these growing needs, producing platforms that have permitted the software unbounded expansion. The mission of software has extended beyond the bounds of Information Systems organizations, causing a fundamental change in the perceived value of software to the enterprise. From its original role of increasing operational efficiency, software has taken on an increasingly strategic role. Knowledge workers outside of Information Systems use software to attain competitive advantage for their business.

Table 1 shows a timeline of major computer trends that have impacted software development since the 1960's. This illustrates the obvious changes in hardware characteristics along with the more subtle changes in software usage. These major events are:

- The price per MIPS (millions of instructions per second) decreased from the $100,000 range to the sub-$1,000 range;
- Hardware architecture diversifies from mainframe hosts to include minicomputers, personal computers, and networked file server systems;
- User interfaces change from data center operators to terminals and personal computers/workstations with graphical user interfaces;
- Desktops connected to networks increase from nonexistent in the early 1980s to nearly seventy percent at present;
- Application architecture evolved from host-based batch processes to include host-based interactive processes, cooperative processes, and distributed processes (client/server and peer to peer);
- Software implementation technologies changed from procedural languages to include specification-based tool environments, custom modularized components, and generic object libraries;
- The percentage of the workforce using software increased from less than 10 percent to greater than 60 percent of the working population;
- The role of software expanded from computational to operational efficiency, decision support and information access, and autonomous decision making;
- The perceived value of software changed from an easily quantified cost itemto a strategic asset.

The chart confirms that software usage and creation has fundamentally changed during this period. Yet, the contracts governing software use have not kept pace. Major contractual items have remained relatively static during this time — terminology used in the contracts; terms and conditions detailing the licensee's rights and restrictions on usage of the software; and the value measurements used to establish the license fees. With both computing capacity and software code having dramatically different value for the enterprise, both software vendors and their customers must address the problems these inconsistencies create.

Software Licensing Problems

Licensing Models Lag Industry Changes

The industry created conventional licensing models (tier-based and personal computer use-based) when the world of computing was decidedly less complex than today. Vendors are now creating new types of software and inventive users are using software in different ways — often in ways that neither would have predicted. Thus, the conventional licensing models no longer seem appropriate to either the vendors or their customers. Moreover, only a small percentage of the multiuser packaged software vendors is offering alternatives to the tiered licensing model, although some are struggling with the design and implementation of different models.

Although there are many problems with software licenses, this paper focuses on problems in establishing equitable license fees.

This section illustrates some of the major difficulties that customers and vendors find when trying to apply the conventional license models to this changed environment. Table 2 illustrates these problems with four scenarios. Each scenario harbors problems for customers and vendors when managed under conventional types of software licenses. The four scenarios are:

1. Proliferation of personal software use in the enterprise.
2. Consolidation of data centers or processing functions.
3. Migration to networked topologies
4. Outsourcing, mergers, and acquisitions.

Scenario 1: Proliferation of personal software use in the enterprise

The spread of personal computers throughout the enterprise has created a monumental software licensing management task. Most of these computers have a collection of personal productivity software bought through the company, personally, obtained as freeware — or bootlegged! Examples include word pro-

Table 2: Software License Problem Scenarios

	User Problem	Vendor Problem
Scenario One Proliferation of personal software use	• Legal liability for unauthorized use • Shrink-wrapped liability	• Loss of revenues from bootlegged license fees • Equitable controls on usage
Scenario Two Consolidation of data centers	• Tiered upgrade fee for same MIPS • No value for previous licenses • Constraints on resource allocation	• Loss of revenues from multiple license fees and from added network functionality
Scenario Three Migration to networked architecture	• Constraints on software architecture • Added distributed computer fees • No credits for old licenses	• Loss of revenue in distributed architecture • Increased costs not covered by downsized fees • Inability to track perceived value
Scenario Four: Outsourcing or mergers and acquisitions	• Fee required to outsource software • Fee required to change legal entity	• Need to renegotiate with new entity • Scope of usage broadened w/o additional income

cessing software, PC-database, and spreadsheet software — all of which have a license that authorizes only the individual purchaser to use it. However, each vendor defines these restrictions slightly differently.

From the Customers' Perspective
Under the terms of personal use-based licenses, as soon as an individual opens the sealed diskette package, that individual binds their corporation to the terms and conditions preprinted on the package. Many times this includes financial obligations that can extend beyond the initial purchase. Yet in most corporations, only the signature of an officer of the enterprise can bind the organization to any contract.

Unauthorized use of software is a major concern for corporations. Both bootlegged software and the use of prior versions of software create a corporate liability. The pervasiveness of personal computers and the relative lack of control over software placed on them, can this be more of an issue than mini, mainframe or even LAN-based software.

Clearly, users may not share software, nor may they distribute it freely over networks. This is hard to control despite corporate warnings against the practice. In many cases, this is only an educational problem. Every person thinks of "buying" something instead of "licensing" it. As a result, most people believe that they can do whatever they want with software they acquire. Yet, one licenses software (not buys) and places restrictions on what the acquirer can and cannot do with that software.

The Problem for Vendors
Vendors experience a serious loss of revenue from the use of bootlegged software. Equitable controls do not exist within the software to prevent this misuse while at the same time permitting businesses to migrate to more powerful hardware platforms without losing their software license privileges.

It is unrealistic to expect vendors to negotiate agreements with everyone acquiring a shrink-wrapped package, so they developed the personal use license. This has proved effective in certain situations. Now that such packages are being purchased in bulk by corporations, the contract should be drafted to protect the vendor's interest and help the customers comply with the license.

Scenario 2: Consolidation of data centers or processing functions

The merging of several data centers into a centrally controlled operation affects every software license. Whereas before the merger, the corporation licensed a copy of a software package for each data center. Following the consolidation it needs only one copy for the enterprise. However, the size of the computer is most often several software classes larger, creating one-time upgrade fees and larger ongoing maintenance fees.

From the Customers' Perspective
Under the terms of the conventional tier-based license, the customer eliminates redundant license fees, but may have to pay an upgrade fee to move the software to a larger computer, even though the total processing power may not exceed the combined power of the original computers and the amount of work processed remains unchanged. Thus, the tiered license adds a seemingly arbitrary cost to the consolidation move, since the customer does not receive any additional value from the same software on fewer platforms. In addition, customers feel constrained by license policies in their distribution of computing resources because no credit is given for prior licenses.

The Problem for Vendors
Vendors have added functionality to their software to enable it to operate over networks and manage remote work units. From a vendor viewpoint, the swapping of several licenses for a single license can result in significant revenue loss — revenue that they depend upon to maintain customer support and enhancements.

Scenario 3: Migration to distributed/networked architecture

The off-loading of processing from the mainframe to networked servers and desktop clients has a significant impact on the software asset portfolio. For instance, when a mainframe database application is distributed among networked workstation servers, processing is distributed among the servers and client computers. No one contemplated such creative use of software when drafting the conventional software contracts.

From the Customers' Perspective

Table 3: Software Licensing Principles Summary

Principle 1:	Software pricing must be fair to both vendor and customer
Principle 2:	The perceived value of software is user-specific
Principle 3:	Value is a function of risk and benifits over time
Principle 4:	Software service is an adequate basis for a software license model
Principle 5:	Appropriate software service metrics depend on the type of software

Customers feel constrained in their choice of software architecture because they must pay for distributed processor license fees in addition to the mainframe license they still have, regardless of the fact that the mainframe computer will become underutilized. This is like throwing away their software assets that they have already paid for in up-front fees. Customers are willing to pay for increased functionality for the networked environment. They realize that this functionality is distributed among multiple servers and clients. However, additional fees based on server computer tiers for the database software do not seem to reflect customers' perceived value of the new software because the size of the database and the number of customers it serves remain unchanged.

The Problem for Vendors
The tiered pricing structure means that prices for distributed software for networked environments are set considerably below those of mainframe software. For vendors, the distributed model may not be reflective of their efforts to bring the software to market.

Vendors face the problem of supporting more CPUs in an increasingly complex networked environment. They have made considerable investments in porting to and maintaining the database software on diverse platforms and of assuring the data integrity and consistency across these platforms. Much of this interoperability is implemented through a new type of software called "middleware" that resides between the computer-specific operating systems and the applications. Somehow the vendors must receive a fair return for this investment.

Vendors also face the problem of creating license fees that more adequately reflect customer-perceived value. Even within a mainframe data center, tiered pricing can yield great inequities — which vendors have difficulty justifying even among themselves. For instance, network management software often executes on the smallest computer available, thus reducing its cost to the customer. Realistically, it should be network-priced so that as a company network grows the vendor's revenues will grow. Likewise, the price of data management software should be based on the DASD farm or some similar measure since the amount of stored data is increasing at a higher rate than MIPS.

The old tiered licensing model becomes completely irrelevant to customers for distributed software architecture, since the concept of physical location does not apply to these applications. In a distributed computing environment, any program can run on any one of a number of systems, across many systems simultaneously or across many systems in sequence. Vendors have difficulty in creating a basis that is proportional to customers' perceived value.

Scenario 4: Outsourcing or mergers and acquisitions

This last scenario concerns two loosely related situations: the outsourcing of data processing to third parties, and the merger of two corporate entities into a single company and the consolidation of the data processing resources. In both instances, the name of the software licensee may change. Yet, the data being processed and the individual customers served remain the same.

Outsourcers cause concern for vendors by consolidating many redundant licenses from the vendor's customer base and paying only one fee to serve all of those customers. Vendors have reason to believe this is unfair, since the outsourcer has unilaterally changed the economic basis for establishing the license fee.

For merged companies, to the extent that this is purely a case of consolidation of tiered licenses, the issues should be the same as in Scenario 2, above. However, some software vendors see issues related to the transfer of the license to the new corporate entity and attempt to impose, a new license fee.

From the Customers' Perception
In an outsourcing situation, the customer may be giving up all MIS functions to its vendor, including all of its licensed software. It may not care whether the outsourcer has problems with the software vendor. However, if copies of the customer's software are transferred to the outsourcer, the customer must determine what rights it has under the license to transfer the software and what restrictions the outsourcer must observe. Moreover, if the transferred software will be used by the outsourcer on a larger computer shared by many customers, the original company may face a tiered price upgrade fee. Customers do not understand the equity of such a fee.

In the instance of a merger, if the new managing entity is different from the licensee, then customers may face new license fees, just for the purpose of changing the name on the license. This creates a gross discrepancy between the license fee and the perception of value for customers.

The Problem for Vendors
Vendors need to determine who the real licensee is and whether it is the same customer under some modified corporate arrangement or legitimately a new licensee. They must also determine who now has access to the software and whether their existing license adequately protects their intellectual property and retains the originally intended scope of the license. Under tiered fees or enterprise agreements set with the expectation of a certain scope of use, these have to be completely renegotiated.

Software Licensing Principles

Why Licensing Principles?

If we expect to see an improvement in software licensing practices, then vendors and their customers must jointly develop a set of shared beliefs. If these beliefs reflect the fundamental basis of their relationship, then they constitute the basic building blocks for the relationship.

Recognizing this, the OURS Software Licensing Task Force devoted much effort to identifying their shared beliefs. These beliefs and their expression in the five principles are the basis for the rest of this paper.

Principle 1
Software pricing must be fair to both vendor and customer

Fairness means that the software's price can be equated to the actual software value to the customer. It is the function of the software license to reflect a proportional balance between the customer's perceived value of the software and the vendor's license fee. The pricing algorithm or model must address this proportionality.

Regardless of the absolute price level, a license fee model will be judged on its behavior. If the perceived value of the software increases, the license model should provide a basis for increased fees. If perceived value decreases, the license model should result in decreased fees. In all, proportional behavior is the key, rather than absolute price levels. The proportionality must be well behaved along the continuum from the low end of the scale to the upper end — regardless of which pricing metric is chosen.

Principle 2
The perceived value of software is user-specific

Software users can only perceive value. There may be little or no relationship to software price. Its value may never be fully quantified in economic terms. Through creative application of the product, users may realize additional value far beyond that originally envisioned by the vendor.

Principle 3
Value is a function of risk and benefits over time

Software value also has both a time and risk/benefit dimension which impact both the vendor and the customer. Predictability is a benefit associated with the software's ability to be operationally stable, functionally upgraded within the same family of processors, and migrated to different platforms. These must all be within time-frames that meet the customer's business requirements. The future benefits associated with avoiding unexpected software migrations or upgrades also affect perceived value. Risks that negatively impact the value of software are such things as the software's inability to meet changing business needs or future configurations, the vendor's long term viability as an enterprise, inflationary tendencies in the maintenance costs from the vendor, or substitute products that redefine value/price relationships. From the vendor perspective, there is a risk that customers may outsource the Information Systems function, downsize, migrate, or replace the product.

Principle 4
Software service is an adequate basis for a software license model

Two components comprise true software value. The first component is its perceived value. The second is the extent of software service, or use-intensity in the organization.

(Note: software service should not be confused with technical support services, professional consulting services, or any other kind of service that is provided by vendors in support of their software.) Because perceived software value is subjective and its attributes are intrinsically difficult to quantify, a "metric" is needed as a surrogate for software value. Depending on the type of software, it is possible to measure the extent of use-intensity of the software service. To the extent that this metric of software service is proportional to perceived software value, we have an adequate basis for a software licensing model.

If software saves measurable amounts of time, perceived value can be estimated. However, most software, such as decision support or strategic software, is practically not quantifiable. It is therefore not possible to formulate licensing models based on notions of the perceived value of software. Sometimes the perceived value of a piece of software varies radically even within a single customer organization. It is easy to see how this is an unreliable mechanism for attempting to create fair pricing.

Table 4: Software Service Metrics for Various Software Types

	Type of Software		
	Single Computer/ Single User	Single Computer/ Multiple User	Distributed Software
Example of software type:	Personal Word Processing	Data Center Operations Monitor	Distributed Database
Architecture Metrics			
Per Computer	■	■	■
Per Network		■	■
Per Site	■	■	■
Per Enterprise	■	■	■
Per Computer Model/Size		■	■
Per Computer Partition		■	■
Resource Usage Metrics			
# of Computers		■	
# of MIPS Used		■	
# of Sites		■	
# of Operating Systems		■	
# of Devices Connected		■	
# of Nodes		■	
# Networks Connected		■	
# Applications		■	■
# Objects		■	■
# Computer Seconds		■	
# Megabytes Storage		■	■
# Minutes Connect time		■	
# Megabytes I/O		■	
Use/Instance Metrics			
Per Logon		■	■
Per Transaction		■	■
Per Job Submission		■	■
Per Use/Time Period		■	■
User Metrics			
# Users connected		■	■
# Potential Users	■	■	■
# Concurrent Users	■	■	■
# Named Users	■	■	■
# Active Users		■	■

Principle 5
Appropriate software service metrics depend on the type of software

The final principle states that the appropriate measure of software service depends on the type of software, its function, architecture, and use. Measures of software service will differ to the extent in which they are proportional to perceived value. Since perceived value is user-specific, the choice of the best metric for software service will vary among customers.

Metrics for Software Service

This section identifies several metrics that the Task Force believes to be useful in measuring software service. For any given type of software, there are many license metrics. However, the metrics in Table 4 represent a fair survey of what may be in practical use in the next few years.

In selecting these metrics for illustration, the Task Force chose to separate the problems associated with measurement and administration from the identification of the metrics themselves. The following section on model selection criteria also addresses site-dependent implementation issues.

Types of Software

Software architecture is the most useful discriminant for service metrics. This helps us define three broad software categories. The metrics seem to relate more closely to software architecture than to any other classification scheme, such as product classification or platform residence. The three software categories are meant to be mutually exclusive.

1. Single Computer/Single User. A personal computer with its personal use software. Personal software lacks the functionality to manage contention for the processor nor can it be shared among multiple users. Word processing software is an example. Even LAN-based software usually falls into this category.

2. Single Computer/Multiple User. This software resides on a single computer. It processes and manages resources centrally but allows distribution among many users, e.g., other processors, humans using dumb terminals or PC's. Examples include multiuser operating systems, host-based accounting applications, report distribution software, and data center operations management software.

3. Distributed Software. Distributed software has functions distributed among one or more CPUs. Executable programs physically reside on multiple CPUs. The software contains functionality to implement their interoperation. Distributed software includes subarchitectures such as cooperative processing and client/server or peer-to-peer computing. Distributed databases, client/server applications, and CASE tools with server-based specification dictionaries are all examples.

Service Metrics

The left-hand column in Table 4 lists a number of software service metrics for each type of software. These metrics are grouped together based on the type of service they measure. For example, architecture-based metrics, i.e., per site, or per computer, record the existence of a network or other physical or logical entity, while resource usage metrics record a grouping of physical or logical resources used by the software. Use/instance metrics relate to the activities that occur within a system. Finally, user-based metrics relate to the number of human users. A "■" in the matrix indicates that the given metric could be relevant to the specific type of software.

Service Metrics Relate to License Problems and Principles

In the construct of Table 4, the Task Force used the five licensing principles to derive metrics that would be useful bases for licensing models. We believe that use of these metrics will result in contracts representing a closer relationship between the perceived value (i.e., software service) and the license fee. For example, in two of the three types of software depicted in Table 4, the Task Force believes tiered license fees based on MIPS capacity may not relate to perceived value.

Using Principle 1 (fees proportional to perceived value), the Task Force created a range of usage-based metrics. These address both customer and vendor problems when relating license fees to perceived value in Scenarios 2, 3, and 4 of the Software Licensing Problems section of this paper (the migration, consolidation, and outsourcing scenarios). Topology-based metrics may be useful in addressing Scenario 1 (problems in PC software proliferation).

Principle 2 (perceived value is user-specific), however, prevented the Task Force from advocating a single metric for any one scenario.

Principle 1, that license fees must be proportional to perceived value, and Principle 4, that software service is a surrogate metric for value, together provide the fundamental basis for the framework of our solution. Any adequate solution must recognize the diversity in types of software and differences in user values. This underlies our proposition of a customizable license choice model. Our choice of software license evaluation criteria reflects these principles.

License Model Selection Criteria

Criteria Key to License Model Choice

The fundamental basis for the Task Force's solution lays first with the concepts expressed in the Software Licensing Principles (Table 3) specifically that license fees must be proportional to perceived value and that software service is a surrogate metric for actual value. With this foundation, any adequate solution must recognize the diversity in types of software and in the customers' corporate priorities towards software value. Our choice of software license evaluation criteria reflects these principles.

Given the great number of combinations of software and associated metrics, how does one choose the best metric and thus the basis for software licensing? Selection criteria must be made explicit. To the extent that customers can articulate their priorities, the license model choices become more apparent.

Choice Criteria Defined

We must define one final element before we can build a flexible license model. This is the concept of "user-specific criteria."

The principles address the concepts of the customer's "perceived value" of software and of "user specific value." Customers need to define which values are important to them before they can negotiate a software contract that meets their needs. Moreover, many companies have found themselves in rapidly changing business environments — that affects their perception of risk/value balance. It is reasonable, then, to expect that one criterion must relate to the concept of "value." We refer to this as a **"Value-Related" Criteria.** This value-related criterion appeals to companies desiring a strong relationship between license fees and their perceived software value. Value-relatedness means that the service metric is proportional to perceived value. Price and perceived value behave proportionately.

Table 5: ACME Software License Model Evaluation Matrix.

Scores are for product/metric combinations. Scores range from 1 to 10 (low to high), based on how well the license model addresses the selection criteria.

Software type:	Operations Monitoring		Distributed Database		Word Processing	
Metrics	Computer	Per	Concurrent	Per	Per	Per
Criteria	Tier	Node	Users	Enterprise	Site	User
Choice Criteria						
Value-Related	3.0	9.0	9.0	1.0	1.0	10.0
Platform Flexibility	1.0	10.0	10.0	10.0	10.0	10.0
Efficiency	8.0	7.0	6.0	10.0	9.0	1.0
Predictability	9.0	7.0	5.0	8.0	9.0	4.0
Totals	21.0	33.0	30.0	29.0	29.0	25.0

Much of the literature regarding IS organizations separates them into categories of leading-edge, middle-of-the-road, and trailing-edge technologies. Today, most in the first category are moving away from centralized mainframe architecture towards some stage of Client/Server technology. Within a short time, many in the middle category will follow. During a period of technology migration, **"Platform Flexibility"** Criteria will be very important to a company in such transition. Platform flexibility is important to companies likely to consolidate or outsource in the future. A metric exhibits platform flexibility to the extent it is insensitive to its resident platform. This does not imply that software performance will be insensitive to platform.

Efficiency Criteria relate to the willingness of companies to invest in software asset management. This includes all issues such as: the availability of usage data, ease of managing the license, collection of the measurement data upon which the license fees are based, and implementation of the licensing management function. While license administration does take some time and effort, some companies still do not perceive it as a priority. A metric is efficient to the extent that it is easy to administer — data can be easily collected and fees calculated. The appropriate software service tools must exist on the system(s) to collect the required data.

Predictability Criteria relate to the need among companies to have reliable estimates of future license fees. Predictability denotes the ability of customers to forecast license fees in advance when given known circumstances. A metric is predictable if customers can forecast fees and vendors can predict revenues.

User-Specific Criteria Imply Tradeoffs

There are inescapable tradeoffs. Any particular license model may do better on some criteria than others. For example, concurrent user-based licenses may be more value-related than computer-based licenses, if the number of concurrent users at a given time is a more accurate measure of use-intensity — the key concept in Principle 4. Site or computer-based licenses do not necessarily bear any relation to use. Customers pay the same fee regardless of how heavily they use the software. However, if the price of software is based on usage, it is relatively less predictable. Sites that place high priorities on value-relatedness may favor concurrent user models over site models, while sites with fixed budgets and frozen computer configurations may favor site or computer licenses because they are more predictable.

Choosing the Best License Model

It is now time to combine all of the above concepts into a framework for selecting the software licensing metric most appropriate to an enterprise. All of the licensing principles shown in Table 3 are embodied in this evaluation framework.

The Evaluation Framework

The framework consists of evaluating each of the choice criteria discussed in the previous section. Each criterion is made user-specific by weighing each choice criterion to reflect individual corporate priorities. The resulting framework is based on:

- The appropriate service metric found in Table 4;
- The type of software; and
- Individual user priorities as expressed in the choice criteria.

Applying choices to this framework creates a model through which a company may choose the appropriate software license relationship.

An Evaluation Example — The ACME Company

Application of this three-step evaluation framework model is best illustrated by means of an example, using the fictional ACME Company.

1. ACME lists the software products under consideration and groups them according to their architecture as in Table 4. For the purpose of this illustration, ACME evaluates three types of software products:

   - Data center monitoring software on a Single computer/Multiuser system;
   - Distributed database software on a networked system of computers;
   - Personal word processing on a Single computer/Single User system.

2. Next they choose the software metrics for each package that they believe apply to their company. ACME chooses two metrics for each product:

- Tiered and per-node licensing for Operations Monitoring;
- Concurrent user and enterprise licensing for Distributed Database;

Table 6: Evaluation of Software Service Measures with ACME's Priorities

Scores are for product/metric combinations and corporate priorities of ACME's CEO reflected in the relative weighting of the evaluation criteria. Priorities were heavily weighted toward models that were value-related and flexible.

Software type:		Operations Monitoring		Distributed Database		Word Processing	
Metrics		Computer Tier	Per Node	Concurrent Users	Per Enterprise	Per Site	Per User
Choice Criteria	ACME CEO Weights	• calculated values					
Value-Related	0.40	1.20	3.60	3.60	0.40	0.40	4.00
Platform Flexibility	0.30	0.30	3.00	3.00	3.00	3.00	3.00
Efficiency	0.15	1.20	1.05	0.90	1.50	1.35	0.15
Predictability	0.15	1.35	1.05	0.75	1.20	1.35	0.60
Totals	**1.00**	**4.05**	**8.70**	**8.25**	**6.10**	**6.10**	**7.75**

- Per site and per user license for Word Processing.

3. ACME then evaluated each metric against the Choice Criteria, using a scale of 1 to 10. The score for each metric reflects an objective judgment of how well the metric meets the Choice Criteria for ACME, (See Table 5).

Note that the numbers represent the *objective scores* for the ACME company. At this point the criteria have not been weighted to reflect the *subjective relative importance* of the criteria to ACME. Thus the management at ACME would come up with the same Table 5 for any company.

Discussion of ACME Intermediate Results

Table 5 shows the ACME evaluation matrix at the end of the first step in the process of building the model. High scores mean the metric performed well. The highest possible score is 40. The results for each type of product are summed over all criteria and shown in the bottom row of Table 5.

The results show that per node licensing is preferable to tiered licenses for operations monitoring software. Even though tiered models may have a slight edge in efficiency, the per node model scored considerably higher on the value-relatedness criteria.

For distributed database, the enterprise metric scored relatively low on the value-related criteria, since enterprise-based licenses bear little relation to the use intensity of the software. The concurrent user metric scored high on this criterion, since the value of the software to the organization will obviously increase in proportion to the number of users served.

The results for database are inconclusive since the value-relatedness advantage of concurrent user-based licensing is counterbalanced by the marginally greater difficulty in managing the licenses (decreased efficiency) and in the lower predictability relative to enterprise models.

The results for word processing software show that the value-relatedness advantage of per user pricing is outweighed by most of the other criteria concerning management and tracking of individual user licenses (efficiency). The result is an edge for site licensing.

If this were the end of the exercise, ACME would choose a per node model for operations monitoring, site licensing for word processing and would be undecided about which model is best for its distributed database. However, this is not the end.

Next Steps in Implementing the Model:

The choice framework now has to include ACME's corporate priorities for software licensing. The CEO states that she prefers license models that closely relate price to the value ACME derives from software. Moreover, there are possible consolidations and strategic networked client-server applications on the horizon. Platform flexibility is, therefore, a close second priority. Therefore, ACME established a company-specific weighting for each of the four Choice Criteria.

In the example in Table 6, the ACME CEO's priorities are simulated by assigning specific percentages to each Choice Criteria. The rule is that all weights must sum to one, so increasing one priority necessarily decreases another. These percentages represent the subjective judgment for the ACME Company, reflecting their CEO's individual corporate values. In her judgment, value-related criteria and platform flexibility receive the greatest weight.

The inclusion of the ACME-specific priorities changes the outcome of the evaluation model. No change occurs for Operations Monitoring, since an increase in the weight for the value-related criterion reinforces the choice to go with per-node licensing. Since concurrent user-based licenses proved to be a relatively better value, the CEO's heavy priority in this area has served to break the deadlock for their Distributed Database, resulting in the choice of the concurrent user model. However, the choice of Word Processing has shifted, to a preference for per user licensing, because the priority on value-related criteria outweighed the increased difficulty of administering individual licenses.

How the Model Can Bring Focus to the Management Process

Let us presume that the ACME MIS director is a risk-averse manager. User-based licenses mean uncertainty for him. He has no idea how many word processing and database users are out there at any one time, so he can't adequately predict license fees. This is especially true with distributed database applications at remote sites. The last thing he needs is to exceed his budget.

He has different priorities and puts these into the license model framework by redirecting the weights proposed by the CEO. He reduces the value-related weight to 0.10, reduces the flexibility weight to 0.25, increases the efficiency weight to 0.25, and increases the predictability weight to 0.40. Without showing the details of the arithmetic in the table, the effect of using these alternative priorities is to leave the choice of Operations Monitoring unchanged but to shift the choice for Distributed Database and Word Processing software to enterprise and site licenses respectively.

The MIS director and the ACME CEO now have a framework for a frank discussion about corporate priorities. Details of software contracts are not relevant to the discussion. However, he can now approach his software suppliers with sense of clarity concerning how he should negotiate.

Focus On What Matters

Rather than making a single, inflexible recommendation for one license structure for all software, the model developed above permits a variety of choices for the customer that conform to their corporate priorities. It organizes the software acquisition process around corporate issues and focuses the contract discussion of what matters. It permits consistent and appropriate decisions within each category of the software inventory.

Summary and Evaluation of the Software License Model

The ACME example, which we have just concluded, started with a rich set of potential software service metrics, the basis for establishing the software's price. Table 4 illustrated these possibilities. They were placed on one axis of a matrix. The other axis contains the four Choice Criteria. The scoring of this matrix gave an objective, base-line measurement of various pricing alternatives. Finally, the subjective judgment of weighting the Choice Criteria produced the data from which a software management strategy emerged. This exercise has illustrated a process for reducing a complex and seemingly intractable problem into a set of manageable tasks, dealt with rationally and consistently.

The Task Force believes that this model reflects the five software licensing principles and addresses the four underlying software licensing problems discussed in the early part of this paper. The example demonstrates two important points:

- It is possible to create different license models which offer more flexibility, greater correlation to perceived value, more efficiency and more predictability.
- There are tradeoffs implicit in the diversity of choices available. Choosing the best license model requires that the priorities among license selection criteria be made explicit.

It is possible to offer some observations on the licensing models that appear valid:

1. Where equity and flexibility are of primary concern, the two usage-based metric groups may be preferred. In an example of network software, a tiered pricing metric might be replaced by number of nodes managed.

2. For distributed software, such as databases and client/server software, service is most easily measured in terms of user metrics. The arrival of license management software capable of monitoring concurrent users should aid the adoption of this class of metrics. For the efficient implementation of most usage-based models, software products will require license monitoring software tools. In some cases, customers may have to review how this code works before installing it within their systems.

3. In the personal software category, enterprise or site licenses appear superior to personal use licenses for companies that lack the administrative ability to closely monitor and distribute software. The balance is likely to shift to personal use licenses once these companies develop a license monitoring capability.

4. Although enterprise licenses are popular today, we observe that these are primarily a reaction to unpredictability and are an expression of the need to maintain flexibility. Enterprise licenses trade off value-relatedness against administrative ease for their justification.

Software licensing will mature if there is a degree of partnership exhibited among vendors and their customers. Clearly, the more sophisticated models will require a commitment to a shared risk for a shared return.

Summary

In the opening purpose section of this paper, the OURS Software Licensing Task Force listed three criteria for measuring success of its efforts. This White Paper addresses the beginning, but not the fulfillment of the first criteria, namely that by the spring of 1994:

"Vendors should have developed and put into use an increased number of alternate license models for all types of software. Software customers should be able to acquire software under multiple licensing models."

The purpose of this paper was to stimulate the discussion of a new paradigm for software licensing. Using the framework developed earlier, when marketing software products vendors can narrow the choices and work with customers to identify their business requirements. These customers will be more adept at sorting out their own values and can articulate their corporate priorities more effectively. Thus, the Task Force's first objective has begun. But from this point forward, both software vendors and their customers have an active role to play.

What Vendors Need to Do

Vendors must develop several license models that more closely reflect their customers' perceived values. While vendors need to offer a variety of license models, they can limit the choices to a manageable number. To establish the true scope, vendors must profile their customer bases to see which types of software service metrics are appropriate to certain segments of their markets (refer again to Table 4), and what technological innovations are needed to implement those service metrics that are more sophisticated.

When vendors come to the bargaining table with license models that match their customers' needs, they can present their software price differentials in terms of meaningful functionality differences. It has been the experience of several of the vendors on the Task Force that offering customers a choice between license models has resulted in improved customer satisfaction. These vendors claim that customers were able to justify the purchase more easily because of the increased proportionality between license fees and perceived value. It is interesting that one vendor that currently offers both tiered and per user licenses has experienced an almost even split between them in spite of the assumption that a majority of customers reject tiered pricing models.

Vendors demonstrating greater flexibility and willingness to help customers implement and manage the more sophisticated service measures will have a comparative advantage in their markets. For instance, for certain use and user service metrics, vendors will need to add measurement tools to their software allowing multiple service metrics. This is needed so that customers can comply with the terms of the contracts without significant overhead. Some vendors are still having difficulty embedding license management technology into their software, not because of the technological issues relating to a few lines of code but rather because of the internal company informational and organizational issues needed to prepare for such a change.

What Customers Need to Do

The customers and users of software need to define their requirements regarding choice criteria and service metrics as they pertain to various types of software. Users need to prioritize their software license selection criteria for each category in the licensing model. Vendors should group their software according to type and a set of acceptable service metrics selected for each group. The best combination of service measure for each type of software should be predetermined using the framework developed in this paper before they negotiate contracts.

Customers should practice using the framework to understand how their choices would change with various technologies. For example, concurrent use metrics may be inappropriate if the technology and infrastructure to manage them efficiently are not universally available or implemented. Consider how the choice would change if all software had license management capabilities. The efficiency score for usage metrics would increase significantly and the current reliance on topology metrics would shrink to its appropriate level.

Customers should communicate their preferred license models to vendors. Discussions between vendor and customer can address whether price differences among competitive software merely reflect functional differences or whether they constitute significant perceived value differences critical to the client's business.

Benefits from These Activities

In each section of this White Paper, from the problem scenarios to the fundamental principles, to usage metrics and the rigorous incorporation of value-relatedness as model choice criteria, this paper has stressed how to get software price to be more proportional to perceived software value. The Task Force is committed to continued efforts to move the industry toward license model choices. This paper is the first step to accomplishing the objective of creating a closer link between software price and value.

The third success criteria expressed in the Purpose is that less time be spent in negotiating software licenses. The Task Force has gone beyond the repetition of license problems and even the description of alternate models to offer a process that can be useful to speed the negotiating process.

The glossary used in this paper is the beginning of a common lexicon to promote the common understanding of license language for the first time. Thus the Task Force believes it has moved a step closer to speeding the negotiating process.

Software Licensing Lexicon

Disclaimer: The Open User Recommend Solutions Software Licensing Lexicon was written for general business use and not as a legal resource. It is not a substitute for more comprehensive technical or legal definitions and does not constitute legal advice.

Introductory Notes

This lexicon was created using the following guidelines:

- All definitions apply to software licensing. *Except in the most necessary cases, the term "software" has not been used as the first word in a term.* There may be variations in other contexts.
- This lexicon is a reference tool for *constructing* and reviewing software agreements.
- These are business-oriented definitions. They may not reflect varying local, national, or cultural practices or provide comprehensive legal or technical requirements and interpretations.
- The purpose of the definitions is to provide vendors and customers with common ground to facilitate software licensing transactions.

This lexicon results from the collaborative efforts of the individuals on the Open-User Recommend Solutions Software Licensing Task Force over the twelve-month period beginning in March of 1992. Members contributed to this document at several working sessions in March, August, and October of 1993 and January of 1994 as well as several smaller group meetings. The material does not represent the views of any single member. The Lexicon represents the combined opinion of the committee. It does not represent the position of any one company.

Acceptance
The specific activities and/or time frame that contractually complete the vendor's delivery of the licensed software.

Acceptance Date
The date agreed on between the vendor and customer for acceptance.

Access
The ability to operate or maintain a software product.

Access Key
Password or authorization code provided by the licensor that enables a software product to be accessed, installed, or executed.
Synonym: Software Key, License Key.

Access Manager
A control mechanism, usually a software program, used to allow access to a software product within the terms of the license.
Synonym: License Manager.

Affiliate
Generally a company associated with another company that may or may not be under common control. Affiliates may be defined by agreement between the licensee and licensor.

Alternative Dispute Resolution
The processes for settling a disagreement outside of court.

Application Program
A software program that applies to the user's specific work, such as payroll or inventory control.

Arbitration
The process through which a third party or parties hear both sides of a dispute and render a decision. The decision may be either binding or nonbinding.

Archive Copy
A copy of one or more software programs or data, saved for future reference.

Asset Management
The process and tools for managing software from evaluation through termination of the license including acquiring, inventorying, usage monitoring, distributing, and ensuring license compliance.
Synonym: Software Asset Management.

Assignment
The transfer of some or all rights and obligations by one party of a contract to a third party.

Backup Copy
A copy of one or more software programs or data typically for recovery purposes.

Backup Computing
Processing done on an alternate system, at the same or any other location, on a temporary basis due to a malfunction of the primary system or unsuitability of the primary location.

Batch Process
A process that executes without user interaction.

Beta Test
The release of a product for testing by users to solicit feedback prior to the product's becoming commercially available.

Bug
An error in a software program that causes the program to malfunction.

Bundle
Two or more products and/or services that are licensed and/or priced as a unit rather than being licensed and/or priced separately.

Business Days
Normal working days, less any recognized holidays, as determined in the location where work is to be performed.

Central Site Support
Software maintenance and support services provided by the licensor to a single licensee location for distribution by the licensee.
Synonym: Single Site Support.

Client
The requestor program in a client/server computing architecture.

Code
Computer language text. See Source Code and Object Code.

Computer
An electronic machine that performs mathematical or logical calculations or that assembles, stores, correlates, or otherwise processes information in accordance with a predetermined program.

Computing Environment
The hardware and/or operating system context for a software product.
Synonym: Platform.

Concurrent Use License
A type of software license that allows access to a specified number of simultaneous users.

Conformance
The measurement of the degree of agreement between software function and a set of specifications.

Consumptive Use License
A type of software license where the use of a software product consumes license units in a non-reusable manner.

Copy
(n) The original or any duplications in any form made from it.
(v) To make a duplicate copy of a software program.

Copyright
The protection given under law to the expression of an idea. Copyright protection is extended to software.

CPU
(Central Processing Unit) That part of a computer system that contains the circuitry and storage that interprets and executes instructions, handles interrupts, and performs timing and other machine-related functions.

CPU Designation
The serial number or the exact identification of a CPU.

CPU License
A type of software license that allows the operation of a software product on a specific designated CPU.

CPU Redesignation
A change in the designation of a CPU on which a product is authorized to operate.

Custom Software
A software program designed or modified to meet specific licensee requirements.

Customer
1. The named licensee.
2. The organization to which an entity is obligated to deliver goods and/or services for a consideration.

Demonstration License
A type of software license that allows the software product to be used for marketing or promotion purposes only.

Deposit Material
A term used in software escrow, to indicate the software source code and related materials.

Derivative Work
A modification to an existing software product that retains features of the original.

Disaster Recovery
The act of restoring a system or stored data to an operable state at the same or any other location following an unforeseen misfortune.

Distribute
1. To make the software available within a licensee organization.
2. To re-sell, sublicense, or otherwise pass a software product on to other customers or distributors.

Distributed Processing
A type of computing in which processing, storage, control, and/or input/output functions are allocated among interconnected processors. There are several types of distributed processing:

Cooperative Processing (or Computing)
A type of distributed processing in which processing, storage, control, or input/output functions are allocated among interconnected processors, each cooperating synchronously to perform the total task.

Client/Server Computing
A type of distributed processing in which a client requests a service or information from a server that performs the service, and/or returns the requested information to the client.

Peer-to-Peer Computing
A type of distributed processing with no distinction between nodes as to roles or services performed. Program control is at each node, and management of shared resources is distributed to all nodes equally.

Distribution Agreement
A contract between a software vendor and its reseller(s) permitting the reseller to market the vendor's product.

Distributor
An entity in the distribution channel between the owner of the software and the end-user.

Documentation
Materials provided with, or available for, a software product for its implementation, operation, and maintenance, such as installation guides, tutorials, reference guides, technical and/or user manuals, and release notes.

End-user
A person or organization that accesses a software product for its own use.

Enterprise
A corporate organization including the parent, its subsidiaries, and/or its affiliates.

Enterprise License
A type of software license that allows use of a software product throughout all or part of an enterprise.

Entity
An organizational component of an enterprise.

Escrow
A contractually defined arrangement, administered by a third party, to assure a licensee's access to source code and other proprietary materials under predetermined conditions.

Evaluation License
A type of software license that allows use of a software product to test functional capabilities and user requirements.

Exclusive License
A type of software license where the licensor guarantees to the licensee that no one other than the licensee will have specified rights to the software product.

Floating License
A type of software license where the software product is not tied to a specific CPU or site.

Installation Date
The date a software product is loaded on a computer and available for use.

Intellectual Property
Ideas, processes, or works of authorship, including designs, methods, inventions, and know-how, which are protected as patents, copyrights, trademarks, and/or trade secrets.

Intellectual Property Rights
The ownership of intellectual property, either by creation or by acquisition from a third party; or the right to use the intellectual property of another as defined in a license granting such use.

Key
Password or authorization code provided by the licensor that enables a software product to be accessed, installed, or executed.
Synonym: Access Key, License Key, Software Key.

License
1. A permission or right to do something which would otherwise be prohibited.
2. The contract granting such permission including all rights and obligations.
See also Software License Agreement.

License Agreement
A contract between the software vendor (licensor) and the software user (licensee) granting the licensee permission to use a given software product subject to certain conditions and obligations.
Synonym: Software License Agreement.

License Key
Password or authorization code provided by the licensor that enables a software product to be accessed, installed, or executed.
Synonym: Access Key, Software Key.

License Manager
A control mechanism, usually a software program, used to allow access to a software product within the terms of the license.
Synonym: Access Manager.

Licensee
The party in a software agreement receiving the license rights granted.

Licensor
The party in a software agreement granting the license rights.

Location
An identified physical address.

Maintenance
A defined level of vendor assistance for the licensed software, which may include such services as defect correction, telephone assistance, and program enhancements.
Synonym: Support Services.

Migration
The transfer of software, data, and the associated processing from one computer to another, one computing environment to another, one hardware platform to another, or one site to another.

Modify
To make changes to a software product.

Multicustomer License
A type of software license that allows the licensee to process its own data and data from one or more of its customers.

Network
A set of logically connected computing devices.

Node
A computing device on a network.

Nondisclosure
An agreement between parties to protect the confidentiality and limit the use of information exchanged or to be exchanged.

Object Code
The binary form of a software program that is directly executable by a computer.

Object-oriented Software
Software built using libraries of reusable, extensible, and configurable software modules.

OEM (Original Equipment Manufacturer)
A term normally used to describe a reseller arrangement, under which the manufacturer of a software product grants rights to the reseller to market the product, usually under a separate label.

Outsource
To delegate the ongoing management and operation of some or all of a customer's information technology components.

Packaged Product
Software distributed in a single package that contains the software media, documentation, and a shrink-wrap license agreement.

Performance
A measurement of software productivity.

Personal-use License
A type of software license that authorizes use by a specific person.

Platform
The hardware and/or operating system context for a software product.
Synonym: Computing Environment.

Port
The process of converting a program to operate in a different computing environment.

Professional Services
Services such as consulting, education, or customization usually separate from the services provided with a software license agreement.

Product
Software programs, data, and supporting documentation.
Synonym: Software Product.

Program
A set of sequential instructions that a computer can interpret and execute, logically assembled or compiled into one or more interrelated modules.
Synonym: Software Program.

Program Levels
A set of terms used to define changes to a software product by the vendor. The conventions may vary by computing environment and vendor. A generally used convention is:

Modification
A defect correction (bug fix) for maintenance purposes and minor functional enhance ments. Synonym: Update.

Release
A revision to a version of a software product. Normally a release is provided to current version licensees who are under a support agreement at no additional charge.

Version
The highest level of a software product. Normally each version has its own license terms and charges. New versions contain major additional or improved functionality and/or performance.

Public Domain Software
Software for which intellectual property rights have expired or have been waived by the owner.

Registered User
A user who is documented by the licensor, or a licensor's agent as a licensee of the software. May also apply to a class of authorized users in a user-based licensing model.

Relocation
The planned physical movement of a software product from one location to another.

Remote Access
Use of a software product from an off-site location.

Reseller
An intermediary in the software distribution process.

Authorized Reseller
An entity that has a contractual agreement with the vendor to provide the vendor's software to third parties under the vendor or licensor's license.

VAR (Value-added Reseller)
An entity that resells the product of another entity after adding value in the form of other products and/or services.

Right to Use
Specific privileges granted to the licensee under a software license.

Run-time Software
Those modules of compilers, database programs, and other development tools that are required in order to operate a program developed using the tools.

Run-time License
A type of software license that governs the use of run-time software.

Seat
A term used to describe a physical device or workstation.

Server
A computer and/or program that accepts, controls, and executes requests for processing or data access from other computers and/or client programs in a network.

Service Bureau
A company or other entity whose primary business is to provide computing services on a common application to other businesses or entities.

Shareware
A software distribution method in which copies are freely made, exchanged, and tried, but if placed into service, the user is honor-bound to pay a fee to the software developer.

Shrink-wrap Software
A method of software distribution whereby the license terms are deemed accepted when the user breaks a shrink-wrap seal or opens an enclosed sealed envelope containing the software.

Single Site Support
Software maintenance and support services provided by the licensor to a single licensee location for distribution by the licensee.
Synonym: Central Site Support.

Site
A location or set of locations, such as an office, factory, or group of offices and factories, university, or other defined boundary.

Site License
A type of software license that authorizes the use of a software product at a named site.

Software Asset Management
The process and tools for managing software from evaluation through termination of the license including acquiring, inventorying, usage monitoring, distributing, and ensuring license compliance.

Software Key
Password or authorization code provided by the licensor that enables a software product to be accessed, installed, or executed.
Synonym: Access Key, License Key.

Software License Agreement
A contract between the software vendor (licensor) and the software user (licensee) granting the licensee permission to use a given software product subject to certain conditions and obligations.
Synonym: License Agreement.

Software Product
Software programs, data, and supporting documentation.
Synonym: Product.

Software Program
A set of sequential instructions that a computer can interpret and execute, logically assembled or compiled into one or more interrelated modules.
Synonym: Program.

Source Code
Software programming statements written in a programming language, which can be translated into machine-readable language for execution.

Standards
Agreed upon aspects of software design, interfaces, interoperability, and compatibility as determined and maintained by recognized, supplier independent, professional, industrial or trade organizations, or governmental bodies.

Sublicense
An arrangement in which a party — that has been licensed or provided certain software usage rights by the supplier or developer, including the right to sublicense — enters into a contractual arrangement with a third party, granting the third party all or some of the rights granted in the original license.

Subsidiary
A corporation or other legal entity that is substantially owned or controlled by another company.

Successor Product
A software product that replaces, supersedes, or makes obsolete an earlier product.

Supplier
A provider of goods and/or services.
Synonym: Vendor.

Support Services
A defined level of vendor assistance for the licensed software, which may include such services as defect correction, telephone assistance, and program enhancements.
Synonym: Maintenance.

Systems Software
Software which controls or manages a computing environment.

Systems Management
The ongoing management and operation of some or all of an entity's computing environment.

Termination
A process to end, cancel, or stop a license, agreement, or relationship between parties.

Third Party
Anyone other than the licensee or licensor.

Third Party Access
Operation or maintenance of a software product by a third party.

Third Party Software
Software that is provided by the licensor under the software license agreement but which is owned by a third party.

Tier
The categorization of a software product for pricing purposes based on machine size, configuration, access limitations, or other attributes.

Timesharing
Providing multiple customer companies access to computer resources including software.

Trade Secrets
Processes and information that are not generally known, which provide an entity with a unique business advantage, and which the entity protects from disclosure.

Trademark
Any word, symbol, device, or combination thereof, adopted and used by a manufacturer or merchant to identify goods and distinguish them from those manufactured or sold by others.

Transaction
A discrete unit of work that accomplishes a particular action or result.

Transfer
A general, nonspecific term often used to address multiple aspects of the movement of software, rights and obligations of software licenses.To assure clarity and precision, use one of the following terms as applicable: CPU Redesignation, Relocation, Upgrade, or Assignment.

Update
A defect correction (bug fix) for maintenance purposes and minor functional enhancements.
Synonym: Modification. See also Program Levels.

Upgrade
A change to a software license to permit greater capacity operation, e.g., on a higher CPU group, or with a greater number of users.

Usage-based License
A type of software license with charges based on a measure of resource utilization.

Use
The operation of a software product.

User-based License
A type of software license that defines a specific number of users, or that designates users by name.

User
A person, entity, device, or process that accesses, operates, or maintains a software product.

Vendor
A provider of goods and/or services.
Synonym: Supplier.

Version
The highest level of a software product. Normally each version has its own license terms and charges. New versions contain major additional or improved functionality and/or performance.
See also Program Levels.

Virus
Unwanted code, which may be harmful or destructive, that is designed to secretly copy itself onto other computers or computer software media.

Warranty
A guarantee or enforceable promise. Typical warranties in software license agreements include warranties of media, warranties of title, and warranties of specifications.

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Object-oriented apps to help curb illegal rain forest activity

BY MARTIN LaMONICA

Lexington, Mass.

Brazilian and international authorities are looking to object-oriented network applications to help them get a handle on pollution and illegal activity in the vast Amazon rain forests.

Raytheon Co. of Lexington, Mass., recently won a $1 billion contract to deploy a computer and communications network stretching across Brazil that will be used to monitor human activity in the Amazon region.

Raytheon will use object technology from Expersoft, Inc. of San Diego to try to simplify operation of the network, dubbed the Amazon Surveillance System (the acronym is SIVAM in Portuguese). The network will provide digital images from satellites and databases to a variety of Brazilian and international agencies in several cities.

Expersoft's XShell object-oriented development environment will form a key portion of the software infrastructure, budgeted at about $10 million, said SIVAM Project Manager Don Nowland in Rio de Janeiro. XShell is an object request broker (ORB) and a development environment that works with several C++ tool vendors' products.

"We are planning on using object technology for the infrastructure in order to build large database systems that can store vast amounts of data that will be used in different applications," Nowland said.

SURVEYING THE LAND

Under the plan, geosynchronous satellites hovering far over the Amazon Basin will gather images of the region to survey for illegal activities, such as gold mining, drug trafficking or illegal burning off of trees and flora for grazing and farming.

Raytheon and its subcontractors will also install between eight and 10 weather stations. Also, 50 subweather stations — solar-powered, ground-based sensors that monitor the air, soil and water for such substances as mercury — will be installed. Mercury, when found in water, could indicate illegal gold mining.

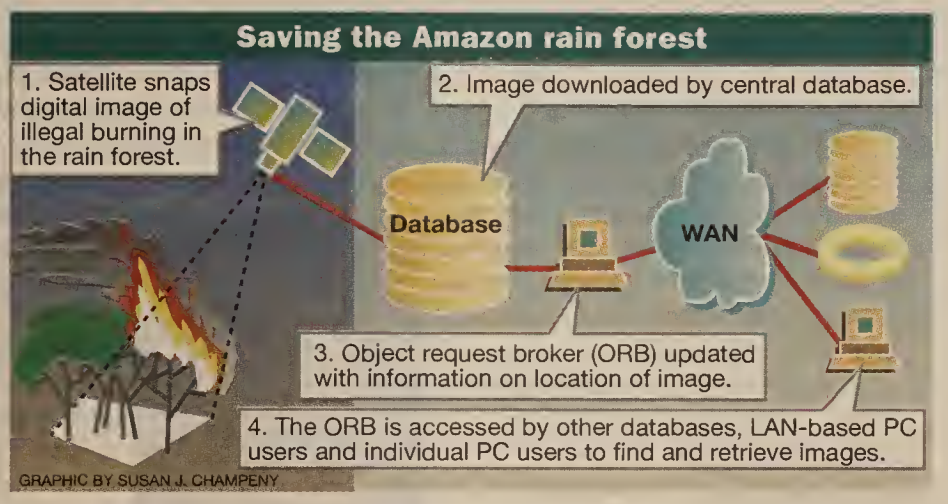
The data will be consolidated across a WAN of satellites and terrestrial lines in one of four regional centers at three sites in the Amazon Basin and in the capital Brasilia. Raytheon and its partners — including IBM Brazil and Sao Paolo-based systems integrator ESCA — plan to construct a system that allows different applications employed by government and environmental agencies access to the same data.

The computing architecture will be made up of several thousand Unix servers connected by LANs, according to those familiar with the project.

This distributed construction will allow, for example, an employee of the Ministry of Indian affairs to query the SIVAM databases and process the data in a specialized application without knowledge of where the data resides. An environmental group might access the same information, such as the amount of air pollution in a certain region, for processing in its own application.

During execution, XShell consists of a distributed ORB that manages communications between applications and data objects across a network. SIVAM's needs are expected to create terabyte-size data objects, such as a database of satellite photos.

Developers will also create applications that must be shared across the WAN. XShell will ensure that an application object for monitoring deforestation, for example, can be transferred from one site to another.



LaMonica is U.S. correspondent for the IDG News Service.

TI strategy

Continued from page 45

models and events, as well as a diagrammer for tracking the life cyle of application components.

TI's Composer tool kit features

- Application partitioning via graphical interface
- Integrated middleware
- Simultaneous client access to multiple servers
- TP monitor support

As the product ships, TI will publish a series of application program interfaces for linking other tools into the previously closed Composer.

In December, TI and Microsoft Corp. will begin to solicit comments from users and other vendors on draft designs for an object repository that is not expected to ship until at least late 1996.

In January, TI is expected to announce Composer support for Microsoft's Object Linking and Embedding 2.0, which has the ability to link clients and servers and will form the basis of Microsoft's distributed object model. During the next six months, TI will release additional data models and tools to reuse code and further ease development work, officials said.

John Logan, executive vice president at the Aberdeen Group, Inc., a Boston market research firm, said Composer and the repository will be welcomed by TI's existing mainframe and Unix developers, who are beginning to look for ways to extend their applications into the LAN. TI seems committed to an ambitious plan to transform Composer into a Windows NT-based enterprise tool, he added.

Composer's pricing starts at $11,000 for a tool set.

✆TI: (800) 838-1843, Ext. 6668.

Notes

Continued from page 45

technology.

"We were stunned, just stunned" to find how limited Notes Express was, Griffin said. Even though he remains impressed with Notes, he could not justify the $80,000 additional expense to buy full-fledged Notes for everybody.

Cliff Conneighton, the Lotus marketing executive who came up with the idea for Notes Express, said the product is aimed at the 50% of Notes users with relatively simple information needs. By making a Notes application program interface available, Lotus gives developers an inexpensive way to access Notes databases via Powersoft, Inc.'s PowerBuilder and other development tools, he said in a message on CompuServe, Inc.'s Lotus Communications conference.

"We're not dropping the price for [full-fledged Notes] for one simple reason: We're trying to run a business here, and the numbers just don't add up to do a major price cut," he said. "Microsoft may be able to sell software below cost, but we can't."

Conneighton said Lotus is not planning a run-time version of Notes.

But Charles Bonnell, a LAN analyst for a large consumer electronics firm said Notes Express could help slow his company's deployment of Notes across its enterprise of several thousand users.

"At $100 [a seat], a manager can justify that," except that in the case of Notes Express, that means buying "an unusable license," Bonnell said. "It distinctly ignores the needs of corporate users and in my opinion is just a bonehead move; they're following IBM's business practices. What we think we need and what Lotus thinks we need are two different things."

Despite Notes' value as a groupware/workflow platform, Bonnell foresees difficulty convincing some departments that they should spend $330 a copy for full-fledged Notes when their users will have no use for its development and administration tools.

Both Griffin and Bonnell said they would be willing to pay $1,000 to $2,000 for a developer's version of Notes in exchange for lower cost run-time clients — similar to the way Powersoft prices its development platform.

Griffin said he is more sad than mad. "I think the criticism is so heavy because people were hoping for [Lotus to succeed]," Griffin said. "If it didn't matter, nobody would be so mad at them."

Comments?

See "How to reach us" on the back page.

CrossTies crosses into mail-based groupware mart

BY ADAM GAFFIN

Carrollton, Texas

CrossTies Software Corp. has made its foray into the increasingly crowded groupware market, announcing collaborative computing software that sits atop a user organization's existing electronic mail network.

CrossTies for WorkGroups 1.0, to ship by November, will feature on-line discussions and the ability to create shared links between a variety of files and documents.

CrossTies President William Lovin said the company will position the Windows product midway between bulletin board applications such as Collabra Software, Inc. Collabra Share and full-blown groupware products such as Lotus Development Corp. Notes.

CrossTies for Workgroups

Key features:

- Windows clients
- Files, folders and documents treated as objects
- Group calendaring

The software will also link to CrossTies' existing CrossTies personal information manager to give workgroups the ability to schedule meetings on-line.

CrossTies relies on a proprietary client object store and the underlying E-mail system's file server to create links to documents, folders and files, according to Lovin. It supports Microsoft Corp.'s Messaging Application Programming Interface (MAPI), the Lotus-backed Vendor Independent Messaging (VIM) API and Novell, Inc.'s Message Handling Service (MHS).

OBJECT MANIPULATION

In CrossTies, all documents, folders and files are treated as objects. This makes it possible for them to be manipulated in a variety of ways — for example, a spreadsheet file could be used as the starting point in a discussion forum.

These objects can be easily linked to other objects by dragging and dropping them, and changes to objects can be replicated to clients via E-mail.

Lovin said the company will position the Windows product midway between bulletin board applications such as Collabra Share and full-blown groupware products such as Lotus Notes.

Hugh Bishop, an analyst at Aberdeen Group, Inc., consulting firm in Boston, said this approach offers users some of the power of forms-based Notes and file-based Collabra Share.

In addition, it extends the capabilities of CrossTies's existing personal information manager to the network.

However, as Lovin agreed, the software is aimed at workgroups of up to a few hundred people, rather than the enterprise.

Lovin said the software comes with user tools for developing new objects and forms.

Tools to access back-end databases, as well as an open API, will likely be shipped concurrently with Microsoft's next Windows release, Windows 95.

Pricing for CrossTies for Workgroups starts at $295 per seat.

✆CrossTies: (214) 407-9996.

EDITORIAL

Congress doesn't get it

"The fault, dear Brutus, is not in our stars,
But in ourselves, . . ."
— William Shakespeare, *Julius Caesar*

In a finger-pointing session after giving up on telecommunications reform for the 1994 legislative season, Senate Commerce Committee Chairman Ernest Hollings (D-S.C.) blamed the regional Bell holding companies, which he faulted for arousing opposition to the Communications Act of 1994.

But that's unfair and untrue. As we reported in a Reader Advocacy Force article (Aug. 29, page 1), the bill was overloaded with costly provisions piled on by legislators seeking to appease special interests.

It was a tower of Info Superhighway babble that deserved to die because the Senate twisted it into something that was a disservice to business users. (Special notice goes to Senate Minority Leader Bob Dole (R-Kan.), who tried to dump on nearly a dozen pages of amendments at the eleventh hour.)

Congress is apparently incapable of dealing with any complex issue, as witnessed by its performance this year with telecom reform, health care and the crime bill. Paralyzed by arcane procedures and its fawning to special interests, Congress must either abandon efforts after months of windy proclamations — as with telecom and health care reform — or produce something like the crime bill, which was shaped more by partisan politics than noble intent.

With all the public awareness of network issues, Congress had a unique opportunity this year to finally come to grips with the rewriting of the Communications Act of 1934. But it abdicated its responsibilities, leaving other parties to shoulder the burden.

In the case of telecom reform, that burden falls to the FCC and the states. The overtaxed FCC has to keep managing an industry marked by blinding change using cobwebbed laws written for a different era. The states must push ahead with their pro-competition efforts in the absence of federal leadership.

All of that means trouble for business customers. The local loop remains locked up, new services are stalled, and the U.S. has lost a needed boost to its status in the global economy. And don't bet on any help from Congress next year. The issues will only be more complicated and the special interests more savvy in manipulating your representatives.

◆◆◆

On another note, take some time to read the special white paper on software licensing in this issue. Produced by the Open User Recommended Solutions (OURS) group, it will help you make sense of software purchasing for an open computing environment by explaining basic licensing principles and offering a lexicon of terms and technologies. The ideas developed by OURS reflect real customer needs and could make buying and managing software a lot easier.

JOHN GALLANT jgallant@world.std.com

TELETOONS

FRANK AND TROISE

DISTRIBUTED COMPUTING

by John R. Rymer

Drastic action required to make DCE a practical solution

The Distributed Computing Environment (DCE) may seem to be taking off, but in fact, its position is very precarious. DCE doesn't have a single, profit-making champion behind it. For DCE to be practical over the long term for corporate development, it will need such a force. Unfortunately, IBM's recent acquisition of Transarc Corp. (*NW*, Aug. 22, page 12) was a step in just the opposite direction.

For DCE to spread, it must become the basis for a rich, varied market of products and services. The current structure won't create the volumes of platform installations that independent tool vendors need to justify creation of software that makes DCE broadly useful to many organizations.

In the meantime, the alternatives to DCE — Novell, Inc.'s NetWare 4.0, Sybase, Inc.'s Sybase 10, Oracle Corp.'s Oracle Parallel Server, and related distributed data access and management products, along with Microsoft Corp.'s Windows NT Advanced Server — are becoming the basis for volume markets. In doing so, these competitors are sowing the seeds of DCE's demise.

The DCE market today is organized in essentially the same way as the Unix market. Vendors can license the technology and then port it to their operating system platforms. The Open Software Foundation, Inc. (OSF) manages this licensing process and also oversees evolution of the DCE code, specifications, extension and conformance testing. Individual licensees are free to apply the DCE technology to meet their customers' requirements.

DCE licensees have an interest in maintaining compatibility of the basic DCE services. However, they also must add value to meet customer requirements and to distinguish their DCE products. The result is variation of the source technology.

In the same way, Unix has been organized around source code provided by Unix System Laboratories, Inc. (now part of Novell), and the result is a diversity of slightly incompatible Unix versions.

As our collective experience with Unix demonstrates, this is not a model to achieve ubiquity. Taken in the aggregate, Unix is widely used. However, in actuality, each of the custom Unix versions itself is a distinct market. Unix tool vendors incur the additional expense of porting to multiple Unix versions and are at a disadvantage to their competitors working in the Windows, Macintosh or even OS/2 markets. Those markets dwarf the Unix market, as Bill Gates is fond of pointing out. (He's right.)

This model didn't create a mass market for Unix. Unix is all but dead on the corporate desktop. The model won't create a mass market for DCE. Rather, it will create a collection of essentially proprietary platforms with a common heritage. Independent software vendors (ISV) won't see large numbers of customers from any one of these proprietary platforms for years, if at all. And so growth of a third-party market in DCE tools, which is vitally important, will be retarded.

The answer is to do something radical with DCE. The owners of DCE — the original investors in OSF — should spin DCE off as an independent, for-profit software company: DCE, Inc. This company would provide a binary software product for a license fee and take full responsibility for the technology's future development and support.

DCE, Inc.'s first priority would be to build a volume market. That would mean providing a single binary product that all ISVs and customers could build for. This step would eliminate the nagging questions about compatibility of different DCE implementations. Interoperability could even disappear as a concern. The specifications and application program interfaces for this environment would have to be published, of course. X/Open Company, Ltd. could take care of that.

Building volume will also mean packaging DCE to make it accessible to the low end of the market. Today, DCE is primarily a high-end product. Focusing on the high end fits the direct-sales approach of IBM, Hewlett-Packard Co., Digital and the other so-called enterprise vendors that are carrying the torch for DCE today. However, today's successful operating environments all have low-end as well as high-end versions. DCE can't buck this trend.

Transarc might have played the role of DCE, Inc. (Transarc and Gradient Technologies, Inc. are the only DCE ISVs of any size.) However, that possibility ended when IBM bought Transarc. Transarc now seems destined to drive IBM's efforts to preserve and extend its CICS customer base. That effort may or may not rely on DCE, depending on sales results.

Why does DCE, Inc. have to be an independent software company? Why can't IBM or HP play this role? Because, as hardware vendors, the software activities of IBM and HP will always inevitably be biased to support hardware sales. Neither IBM nor HP has had great success in establishing software-only businesses for this reason. DCE must evolve independently of hardware tie-ins, just like most operating system software today.

Microsoft might eventually take on the role of promoting DCE as part of its next-generation platform strategy. The next generation of Windows NT will include a variety of distributed computing services. The remote execution service, Microsoft has already revealed, is a custom implementation of the DCE remote procedure call specification. The security service is a custom implementation of the DCE Security Services spec. Microsoft hasn't revealed its direction on directory services yet, but could choose to use DCE's spec again.

The Unix market has already begun to evolve toward a binary product managed by a single vendor. DCE should follow suit. The alternative is to see DCE become a specialized high-end distributed computing platform from a handful of vendors.

That's not the best outcome for users. Users may start out building big, complex, transaction-oriented systems using DCE. But eventually, they'll want to be free to employ DCE on all kinds of systems. These customers will need a volume market to ensure availability of products that allow them to deploy DCE to both small and large systems.

Rymer is editor in chief of *Distributed Computing Monitor*, a monthly report published by Patricia Seybold Group, Inc. of Boston. He can be reached at (617) 742-5200 or via the Internet at jrymer@psgroup.com

Letters

Editor's note: We opened the flood gates with our recent pro/con on whether the Internet Society has the authority to set a code of conduct for the Internet (Sept. 12, page 67). Many readers expressed outrage that we allowed Martha Siegel, CEO of Cybersell, Inc. and an attorney with the law firm Canter and Siegel that advertised its services on the Internet, to express her views.

Network World's Opinions pages are a forum for the free exchange of views and ideas. We encourage members of the networking community to express their opinions — even unpopular ones — and to respond to the opinions expressed by others.

We have published many different views on the Internet by columnists such as Ed Krol, Scott Bradner and Mark Gibbs (see story, this page). We invite others to share their views on this important area.

The following letters were sent to NW via the Internet. Many of their authors stressed that these views are their own and do not reflect those of their employers.

Wasted space

Suffice it to say that in my opinion, your decision to provide Martha Siegel with a platform for her uninformed and destructive views was questionable at best. Moreover, Ms. Siegel's infamy derives not from her activities on the Internet, but from her abuse of Usenet. These two are not identical, despite the confusion over this point in the popular press.

I'll leave it to others to counter Ms. Siegel's nonsense point by point, since I have work to do. In the future, I hope your editors have the good sense to devote the scarce page space they have to more worthy material. If Ms. Siegel would like a platform from which to spew her drivel, I would suggest that she be directed to your advertising sales representatives.

Chris Walsh
Manager of systems development and analysis
Electrical Engineering and
Computer Science Department
Northwestern University
Evanston, Ill.

Put ads in their place

I am one of the millions of users who received multiple copies of the Canter and Siegel ad. I have no objection to advertisements on the Internet — in their place. Yes, the Internet has pornography, dirty jokes, racism, sexism and other negative facets of our democratic society, but I don't have this stuff blasted at me involuntarily. It is the indiscriminate transmission of ads on just about every mailing list that I find objectionable.

While I do not generally support censorship, I am amazed at Ms. Siegel's chutzpah and arrogance. Ms. Siegel has, in essence, walked (uninvited) into the Internet community, violated basic tenets of Netiquette and courtesy for her own financial gain, and then cited the lack of any written rules as her excuse — this, followed by an excoriation of the Internet Society (ISOC) for attempting to formalize such rules of conduct. Just as her past actions demonstrate a lack of understanding of good Internet citizenship, her column demonstrates lack of understanding of the role of the ISOC, how it came to be and historical precedents.

While I do not advocate returning to the days when the Internet was reserved for tech weenies, it is the recent wave of new users like Ms. Siegel that are making written rules necessary.

Gary Kessler
Senior member of technical staff
Hill Associates, Inc.
Colchester, Vt.

Flaws addressed

Anthony Rutkowski's "pro" article on the Internet code of conduct is flawed on several counts in its attempt to make the case against federal regulation. I will address two of the more important errors he made.

First, Mr. Rutkowski said the Internet "consists of 35,000 private nets" and, further, "services generally, and information nets in particular, are overwhelmingly the province of the private sector with minimal government involvement." What country is he talking about? In the U.S., the Internet consists largely of nodes, gateways and large mainframe and switching centers operated by universities, research labs and other federally and state-funded institutions. Furthermore, federal and state taxes as well as student tuition are a large portion of the financial base of Internet systems. Public funding will continue to be the principal source of Internet infrastructure investment and maintenance funding.

See **Letters**, *page 52*

AND ANOTHER THING . . .

by Mark Gibbs

'Thank you, Ms. Siegel'

Rather than heap yet more opprobrium on Martha Siegel, we should thank her. She and her partner have done us a great service: They have forced us to reevaluate where Internet culture is and where it is going.

By being brash and ignoring netiquette, Canter and Siegel have become the virtual equivalent of the biblical money changers who marched into the temple and set up shop.

And I'm not convinced that this is a bad thing.

On the whole, most of the letter writers who responded to Ms. Siegel's column want to extract justice. They want to make the lawyers suffer for their impertinence.

Well, guys, I'm here to tell you that you're wasting your time. Unless you want to go to completely moderated newsgroups (which will be a success when hell freezes over), you can't stop this kind of behavior.

Canter and Siegel have done us a great service: They have forced us to reevaluate where Internet culture is and where it is going.

The reason the biblical money changers set up shop in the temple was that as good businessmen — er, perhaps that should be sharp businessmen — they knew that location, in money changing as in real estate, is everything.

The time-honored principle is to go where the marketplace is. It is no good setting up shop or putting your advertisements on Nowhere Street. Thus, unless you're brain dead, you go where the action is — and on the 'Net, newsgroups are definitely where you find *a lot* of people.

As a consumer in the real world, you can choose what you look at. As you walk down the street, you don't read all of the billboards. You skim them and pass on.

"I just bought a car, and there's a car on that one. I won't read it. . . . There's a stereo on that one; hmmm, that's interesting. . . . There's dog food on that one, and I only have cats, so I don't care. . ." and so it should go.

If you consider billboards offensive then you could try to remove the source of the problem by legal means. You could even go so far as to campaign for a law to control their use.

But we all agree that on the Internet, the last thing we want are laws imposed by the government. Considering that the government barely understands telephones, letting them get a toehold in Internet legislation would be like letting a vampire loose in a blood bank.

The good news is that Internet users' reaction to the actions of Canter and Siegel will make many others who would copy them think twice before doing anything else that is so contrary to the Internet culture.

The bad news is that many won't care and will go ahead anyway.

What we don't need is all the wasted verbiage and inflamed passions that these kinds of events stir up. We need to look at the challenge that they represent and meet that challenge head on.

We also don't need name-calling, which simply discredits the writer rather than gaining justice. And cries of foul are meaningless when there are no rules, only conventions.

What we need is a mature, sophisticated response that solves the problem.

Now I don't know what that response might be, but I have some ideas.

For instance, how about a voting system that allows readers to object to messages?

When a certain number of votes is reached — a value determined, say, by the average traffic carried by the group — the offending message is automatically purged.

I believe that the Internet can solve its own problems, and solve them effectively and efficiently. But no amount of complaining, flaming offenders or getting mad with *Network World* for airing what I believe is an important issue will solve the problem.

The Internet is undergoing its biggest transformation yet as it lurches towards commercial maturity, and nothing can stop that process. It is up to those who care about the Internet culture to find solutions.

We should thank Ms. Siegel for bringing this serious matter to our attention. Then, we should just ignore her. We have more important things to do.

Gibbs is a contributing editor to *NW* and president of Gibbs & Co., a consulting firm in Ventura, Calif. He may be reached at (800) 622-1108, Ext. 504, or via the Internet at mgibbs@rain.org.

Letters

Continued from page 51

Second, Mr. Rutkowski is uninformed about telecommunications regulatory history or current practice, stating with "the electric telegraph 150 years ago, similar concerns motivated cooperation ... through international unions." This cooperation dealt with technical standards and international interfaces, through the offices, for example, of the CCITT.

Cooperation was not the means by which unethical behavior was controlled in the U.S. Rutkowski fails to point out that pricing abuses, anticompetitive behavior and company actions that were offensive or would cause public harm was, and still is, regulated by the Department of Justice, the Federal Trade Commission (FTC) and the FCC.

Admittedly, there should always be efforts to improve the workings of our imperfect government agencies, but history has proven that government involvement is necessary, particularly when public funds are spent. The FCC, FTC and perhaps other agencies need an expanded mandate to regulate against the ills to which Mr. Rutkowski alluded.

Left to private interests, there will be a never-ending debate over contradictory solutions, with an aim, too often, to maximize profit of the solution advocate.

As Mr. Rutkowski's article reveals, the Internet Society (ISOC) is ill-equipped to take on a leadership role dealing with ethics or codes of behavior. ISOC should devote itself to advising on technical steps to correct Internet systems problems — viruses, traffic bottlenecks and the like.

Stanley Spiegelman
Independent consultant,
information and legal services
Pelham Manor, N.Y.

The party's over

I was going to start this out by saying that Martha Siegel still doesn't get it, but upon reflection, she certainly does get it.

Very clever, doing all that flag-waving about censorship and pornography and painting the Internet Society (ISOC) as heavy-handed, authoritarian and arbitrary — the net police, swooping down and stopping people it doesn't like from making money on nets that it doesn't even own.

However, once again truth and fine rhetoric work at cross purposes. Any traffic policing functions ISOC takes on — with which it will ask that people voluntarily comply — it does so only reluctantly, due to the death of acceptable-use policies, to forestall the government from stepping in and regulating the net. And actions like Ms. Siegel's bring that unwanted day ever closer.

It is clear that the Internet's days of splendid isolation and anarchy are over. It was inevitable, as the Internet grew beyond its research roots and into a proto-National Information Infrastructure, that its commercial potential was realized and then exploited. Ms. Siegel and her partner's roles as no-name point men in this invasion makes them as wanted as the wits who dreamed up telemarketing and infomercials. The only thing that makes them noticeable is their continued hubris in painting this as a free speech issue and stubbornly refusing to acknowledge that their actions have negative consequences for Usenet, the Internet and its denizens.

Gary Phillips
Analyst
Compex Corp.
Alexandria, Va.

Rules exist

Your pro/con raised many issues regarding the establishment of rules of conduct for Internet usage.

Both writers (but to a much greater extent Ms. Siegel) ignore the fact that the Internet has already established just such a standard, known as "The Rules of Netiquette," which is available at most access sites. The Internet has *already* declared which forms of behavior are considered acceptable and which are not. Since its inception, these rules have been enforced through an "enlightened anarchy," as people who violate these rules are made aware of their transgressions by others on the 'Net. However, as the Internet has grown, this system is beginning to work less effectively for several reasons.

Term defined

Netiquette: A pun on the word "etiquette" that refers to proper and tasteful behavior on a net communications system.

First, the number of new users is exploding, and these users are quite unlike those who came before. When the Internet was the sole dominion of academics, science and government, it was regarded as a valued resource, to be protected and shared.

The people who used it obeyed the rules, even though there was little in the way of enforcement, because they understood that to ignore these rules would hurt everyone, including themselves.

On the other hand, many of the new users are paying for Internet access through commercial service providers, and expect the Internet to be just another service there for the taking. Providers like America Online (AOL), CompuServe and Prodigy offer access to the Internet to their users, but they provide nothing in return to the Internet. They offer no File Transfer Protocol (FTP) sites, no access to their discussion forums, and so forth. For those on the Internet who provide their resources free of charge, it is an unfair exchange. This can be seen in the resentment expressed throughout the Usenet forums.

I think it is important for new providers of Internet access to take a look at their practices and make sure that they put into the Internet as much as they take out.

They should offer FTP sites, Gopher sites, discussion forums and so on to Internet users as well as their own. To twist a few metaphors, all take and no give will kill the goose that laid the golden egg.

The second reason why this system is working less effectively is that transgressions of netiquette are often being met with unnecessary force (flames, in Netspeak). While there is no question that poor behavior should be corrected, it is unnecessary for a person to receive thousands of "don't do that again" messages in response. And, if people on the 'Net knew that the service providers would correct this behavior, they would not have to attempt to do it themselves.

The third reason for increasing tension is unrestricted advertising on the Internet. Many people are using unsolicited E-mail or "spamming" Usenet, as Canter and Siegel did. They believe they have a right to send whatever they choose, because they pay for their access. They ignore the fact that other users also have to pay to receive these messages.

The Internet is not like television or print media, where advertising subsidizes the cost of the medium.

Therefore, advertisers have much less right to engage in unsolicited and untargeted advertising. Such advertising should be limited to Usenet forums where such announcements have been deemed appropriate. If Canter and Siegel had posted their advertisement to just a few appropriately targeted newsgroups (alt.legal, misc.legal or alt.alien.visitors), they would not have been flamed. They could have even started a new newsgroup, like alt.law.immigration.us. Instead, we now have groups such as: alt.flame.canter-and-siegel, alt.lawyers.sue.sue.sue, alt.green.card.lawyers as well as alt.lawyers.die.die.die" dedicated just to this one infamous law firm.

The Internet needs a system of checks and balances on behavior. Internet users need to be protected from those who ignore and violate the accepted standards. Users also need to be protected from exceedingly harsh flaming. The obvious way to achieve both of these goals is for there to be better organization among the Internet service providers. New users would be trained by their providers on proper behavior. And, when they see others acting improperly, they would have one person to report this behavior to. This would allow for a bit of order, without restricting the free expression that has been the hallmark of the Internet.

Byron Jones
Microsystems manager
Office of Admissions
University of Miami
Coral Gables, Fla.

INTERNET tip

BY ADAM GAFFIN

One in a series of occasional tips on Internet-based information services.

Netiquette

There are several guides to netiquette that focus on Usenet, where Internauts congregate and chat. Topics include:

- ✔ **How to respond appropriately to messages**
- ✔ **When to cross-post comments to multiple conferences**
- ✔ **Avoiding vitriolic on-line arguments**

To access:
Netiquette guides are posted regularly to the news.newusers.announce newsgroup on Usenet. Chuq Von Rospach's netiquette primer is also available via Gopher and anonymous FTP. For Gopher, connect to gopher.eff.org. From the main menu, select Net Info, then Introductory and then scroll down to the netiquette.faq file. For anonymous FTP access, connect to ftp.eff.org. The path is /pub/Net_info/Introductory/netiquette.faq.

Gaffin can be reached via the Internet at agaffin@world.std.com.

Forum denied

I'm astounded that you provided a forum for the infamous green card lawyers. As if they haven't stolen a forum of their own from Usenet system owners!

Some people enjoy letting other people use their property. So they put postings on their property saying, "You can go here, but please stay out of the flower beds." Similarly, Usenet systems administrators have said, "You can make postings on my system, but keep them noncommercial and in the appropriate groups." The green card lawyers come in, trample the flowers and pout because people don't love them anymore.

Russell Nelson
President
Crynwr Software
Potsdam, N.Y.

Build your own net

It was with great dismay that I read Martha Siegel's recent opinion column. It is entirely evident that she still doesn't understand the controversy her recent newsgroup-wide posting of advertising material caused.

The pertinent issue here is not whether advertising on the Internet is acceptable; there are many news groups specifically devoted to advertising.

Nor is it whether any one group has the right to censor the postings of others. Ms. Siegel's statement, "One wonders what sort of mentality is shaken to the core by an ad, but finds profanity, pornography, electronic vandalism and censorship only mildly offensive or even, in the name of a pet cause, justifiable" is a total nonsequitur.

It completely sidesteps the true issue, since the complaint from Usenet participants at large is not about her ad, or its content, but rather the irritating way in which it was posted across all news groups.

People who find pornography offensive can choose not to subscribe to newsgroups containing such material because the authors have segregated their postings in compliance with acceptable netiquette. However, when Ms. Siegel chooses to ignore this posting etiquette, she denies all Usenet users the ability to avoid reading that material that is either offensive or irritating to them.

Furthermore, Ms. Siegel states that there is a "precedent for standards of cooperation" regarding the use of facilities such as the air traffic control system. Yet, she then claims that any attempt to "control the behavior of those who use such facilities" is unprecedented and appalling.

I fail to see how these two issues are different. The very standards of cooperation that Ms. Siegel lauds are, in fact, controls on the behavior of the users of such facilities, necessary to maintain some standard of operation. Imagine the chaos that would ensue if airline pilots didn't control their behavior and instead simply flew where they wished. Would this not make the air traffic control system effectively useless?

See **Letters,** *next page*

Help desk

Continued from page 2

verify that the accounting package will accept telnet connections.

You will be using TCP/IP, so you should get a Class C IP address range from the Internet Network Information Center (InterNIC). Contact the InterNIC by phone at (703) 742-4777 or via the Internet at hostmaster@internic.net.

Next, you will need to add Ethernet to the RS/6000. If it is running AIX 3.0 or higher you can just install an Ethernet card and run the SMIT command to assign the RS/6000 card an IP address.

Install MacTCP 2.0.4 or higher on each of the Macintoshes. You can get MacTCP from either System 7.5 or from the floppy disk included with the book *The Internet Starter Kit* by Adam Engst (MacMillan Computer Publishing).

Next, you will need a telnet application for the Macintoshes. The most common telnet application is NCSA Telnet. NCSA Telnet is freeware and can be obtained from *The Internet Starter Kit,* your local Macintosh user group or just about any Macintosh user who accesses the Internet.

Set NCSA Telnet to emulate a VT-220 terminal so that you can emulate the function keys of your IBM terminals. NCSA Telnet gives you a scrolling text window of data. You can print the accounting data by selecting the data with the mouse and then choosing the Print option from the File menu.

The selected text will then print to the networked LaserWriter. You can also save the selected text on your hard drive by using the Copy and Paste functions.

Once your Macintoshes are telneting into the RS/6000, you will need to connect the remote site with a WAN connection. Purchase a set of WAN routers to create the Ethernet link between the two SynOptics hubs. There are many vendors of WAN routers; make sure the ones you purchase route TCP/IP and AppleTalk.

Be prepared to spend about $8,000 for the WAN hardware and at least another $8,000 a year for WAN connection charges.

For better RS/6000 performance, you might want to check out IBM's Network Terminal Excelerator Adapter and 7318 Serial Communications Network Server.

The Network Terminal Excelerator Adapter is a smart Ethernet card that handles all the TCP/IP and telnet processing instead of it being handled by your RS/6000 processor.

The 7318 Serial Communications Network Server allows you to install some 3151 terminals at the remote site and connect them to the RS/6000 across the WAN.

If you attach the 3151 terminals into the Network Server and attach the Network Server to the network, the terminals will be able to communicate with the RS/6000 as if they were in Connecticut.

To use this server, your router must be able to handle IPX packets.

For more information about the IBM products, contact IBM by calling (800) 426-2255 or access IBM's World-Wide Web server on the Internet at: http://www.autin.ibm.com/hardware/IO/index.html.

Letters

Continued from preceding page

There is another important issue of which Ms. Siegel may not be entirely aware. Usenet is essentially a cooperative store-and-forward messaging system. Managers of Internet-connected hosts graciously forward Usenet news articles to neighbors in a completely voluntary and cooperative arrangement. The cost of the facilities necessary to transmit such traffic are borne completely and willingly by the managers of those systems. They are under no obligation to carry traffic which they feel violates the spirit of this cooperative environment. If people like Ms. Siegel prevail and the standards of Usenet usage are pushed aside in favor of an "I can do whatever I want" attitude, Usenet will cease to exist.

The fact that out of "15 million to 30 million diverse Internet users" Ms. Siegel received favorable responses from only 20,000 is not a particularly compelling argument that such behavior is acceptable to the Internet community at large. If Ms. Siegel read the Usenet at all, she would be well aware of the tremendous outcry from many of us who have been using Usenet for nearly a decade.

The bottom line is this: Other people (read: not Ms. Siegel) have spent more than a decade building the Usenet. It is an entirely voluntary, cooperative effort among system administrators that keeps it going.

If Ms. Siegel doesn't like the standards of cooperation that currently exist, she should build her own network. But, please, don't ruin this one for the rest of us.

Brian Cuthie
President
Systemix Software, Inc.
Columbia, Md.

Tabloid tactics

The E-mail address at the end of Martha Siegel's interesting "con" column was incorrect. It should have been: selfserving-bull@bullblasters.com.

I don't think *Network World* has ever previously run an article that was so completely free of content and full of defensive spleen. It was rather as if an articulate unrepentant felon were given the opportunity to defend the merits of armed robbery ("Hey, I got away with it. Cool. The heck with you.") against some stodgy police spokesperson ("This kind of thing is bad... blah.").

Overall, people's reaction to the piece was "What do you expect? She's a lawyer. All lawyers are self-serving scum. This kind of free publicity is the best thing that could happen to little-league ambulance chasers."

I think this piece marks *Network World's* descent into tabloid journalism.

Dan Magorian
Network Infrastructure Group
University of Maryland
College Park, Md.

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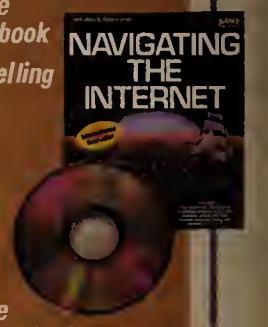

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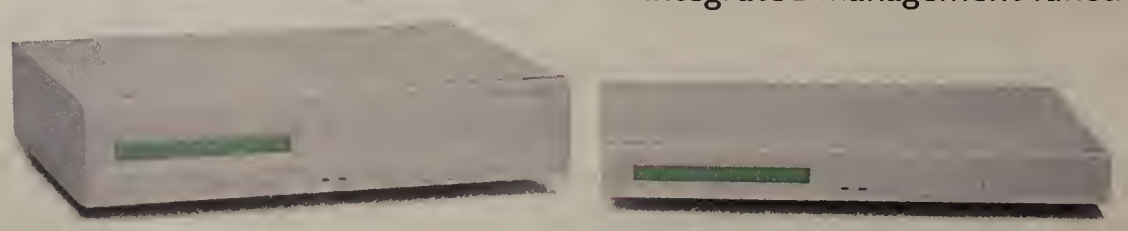

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A straightforward decision

By MARK LANGNER

New applications and wider availability simplify the **switched data** *selection, but users must still sort through subtle differences among providers.*

INSIDE

Making the equipment connection is getting easier. ***Page 58.***

A prescription for overcoming option paralysis in selecting a data service. ***Page 59.***

Buyer's Guide chart helps make a straightforward decision even easier. ***Page 60.***

Readers divulge why the move to switched data is on. ***Page 61.***

Carriers bulk up support service to help switched data shoulder the heavy burden of videoconferencing. ***Page 63.***

As workers continually take up residence in remote confines, switched digital data services are finally winning respect from network managers for their simple and economical way of supporting occasional data transfer needs.

Net managers are increasingly turning to switched data links and even ISDN Basic Rate Interface lines to let users dial up a host or remote LAN, send data and hang up when done. The only differences between this approach and plain old dial-up voice links are that the data travels over all digital circuits and users pay a little extra for the added reliability of digital transmission.

Simply put, users are getting more comfortable with circuit-switched digital data and what it can do. "It looks like voice, tastes like data," says Bernie Schneider, director of data product management at Sprint Corp. "And that makes it easier for users to swallow."

And what makes it even better for network managers is that the selection process is relatively straightforward. Essentially, all a manager needs to do is make sure a carrier provides the speed required — anywhere from 56K bit/sec to T-1 — and is able to get the data where it needs to go.

In an effort to differentiate themselves, carriers have added a few marketing twists to their switched data offerings. For instance, carriers lump switched data services with larger voice service plans, and they have begun to offer packages that bundle switched data service, access equipment and support for specific applications.

Switched data used to be synonymous with videoconferencing. But as dial-up routing and remote LAN access applications become more popular, network managers are finding new uses for switched data.

"It used to be that people just thought video when discussing switched data services," says Bill Scullin, product manager of switched data services for AT&T. "Eighteen months ago, as much as 75% of new switched data installations were for video. Today, it's more like 50%."

Network managers agree. "We began using it for backup on our routers, but it is now a major part of our strategy for connecting occasional and traveling users," says Jeffrey Kipnis, assistant vice president at First National Bank of Chicago. First Chicago's Community Banking Group is using Ameritech-provided ISDN Primary Rate Interface and BRI links for disaster recovery and LAN connections to remote branch banking sites. BRI is also used to support remote off-hours access to LANs.

As users find new applications for switched data, service availability — particularly ISDN BRI — is broadening across the local carrier market, and interexchange players such as WilTel and LDDS MetroMedia Communications Corp. are getting into the act. And the cost of local switched data services that feed their long-distance counterparts is becoming more reasonable. It was just a few short years ago that users had to acquire an expensive leased line to access long-haul switched data services — something that could quickly offset any long-distance savings gained from changing out low-speed leased lines for switched data.

"The growth of ISDN BRI availability has made switched data services viable for a number of applications that it wasn't viable for a year ago because you couldn't reach that location," says Frank Shaffer, senior manager of advanced service development at MCI Communications Corp.

And carriers are launching new services such as digital 800 and ISDN multirate. Digital 800 enables callers to establish toll-free switched data links that can, for example, support dial-in videoconferences at consulting practices or make it possible to buy and download software on-line. ISDN multirate enables users to tap the signaling channel of an ISDN PRI access line to establish multiple switched 64K bit/sec or higher speed links on a call-by-call basis.

Carriers have also created subnets to carry switched data traffic only, a move that puts the reliability of switched data services on par with leased lines. Additionally, sending data over a subnet of switched links enables users to avoid circuit degradation or failure in a way that private lines cannot.

Sprint was the last of the major carriers to start riding switched data traffic over a special subnet, dumping its voice network as the primary transport mechanism in favor of a new circuit-switched data network dubbed the Diamond Network.

NETWORK WORLD SHORT LIST 1994

Switched digital data services

- **AT&T** *Family of switched digital data services*
- **Bell Atlantic Corp.** *IntelliLinQ Service*

Complete details about The Short List appear on page 61.

SWITCHING OPTIONS

There are really only a few classes of switched digital services. At the high end are switched data options provided as part of an interexchange carrier's (IXC) virtual private network offering. AT&T's Software-Defined Data Network (SDDN), MCI's MCI DataStream for Vnet and Sprint's Switched Data Service Premiere are examples of these services.

These services generally offer the broadest range of speeds — up to T-1 — as well as the lowest rates and such virtual private network features as abbreviated dialing, enhanced call routing, and accounting and billing features. The closest thing to a switched T-3 link today is a reserved private-line offering. This reserved offering requires net managers to request a carrier set aside T-3 bandwidth for when its needed and pay a flat rate to cover the time the service was in use.

Users that already have a virtual private network for voice are more likely to buy switched data from the same carrier. And because voice traffic usually far

Continued on page 58

The equipment equation

Improvements in customer premises equipment (CPE), coupled with comarketing arrangements between carriers and equipment makers, is helping to fuel user interest in switched data services.

With improved CPE more readily available, users have a greater understanding of what it takes to support a switched data service application. Gone are the days when users got unexpected surprises in their switched data service bills: charges for equipment they didn't know they needed.

For example, a software firm in Washington, D.C. was less than thrilled when it found a monthly equipment charge of $300 added to the bill for a Bell Atlantic Corp. ISDN Basic Rate Interface circuit. The charge covered the carrier's cost of providing a Network Termination Type 1 device needed to convert the four-wire signaling from a user's ISDN terminal adapter for transmission over the two-wire local loop.

This symbolizes some of the problems users faced in moving from analog to digital data services a few years ago. A full understanding of all the bit parts of the switched data application eluded many end users and carriers. Those who did have a grasp of hardware requirements often complained about equipment complexity and expense.

"It is difficult enough managing multiple projects without having to figure out complex hardware," says Jeffrey Kipnis, assistant vice president at First National Bank of Chicago. "One of the reasons we went with ISDN is that the hardware has become inexpensive and easy to operate." The bank is installing an ISDN net and is impressed with Ameritech Corp.'s ability to provide equipment and service installation, as well as maintenance support.

Equipment is indeed now better and less expensive. For instance, users can buy a basic intelligent access device or inverse multiplexer that allocates bandwidth based on demand, schedule or priority for about $600. This is comparable to the price of one of the new crop of high-speed analog modems. This equipment also lets users optimize expensive leased local access links to long-haul switched data services by allowing multiple applications to share those same lines.

Users still unwilling to take on the added chore of selecting CPE separately from the service have an alternative. They can buy, lease or rent equipment from local or interexchange carriers. For instance, Bell Atlantic provides joint marketing with Ascend Communications, Inc., AT&T, Connective Strategies, Inc., Combinet, Inc., DigiBoard, Gandalf Systems Corp. and IBM. Pacific Bell works with companies such as AccessWorks Communications, Inc., Cisco Systems, Inc., DigiBoard, IBM and Intel Corp. to make it possible for users to order service and equipment at the same time. Other carriers have similar programs.

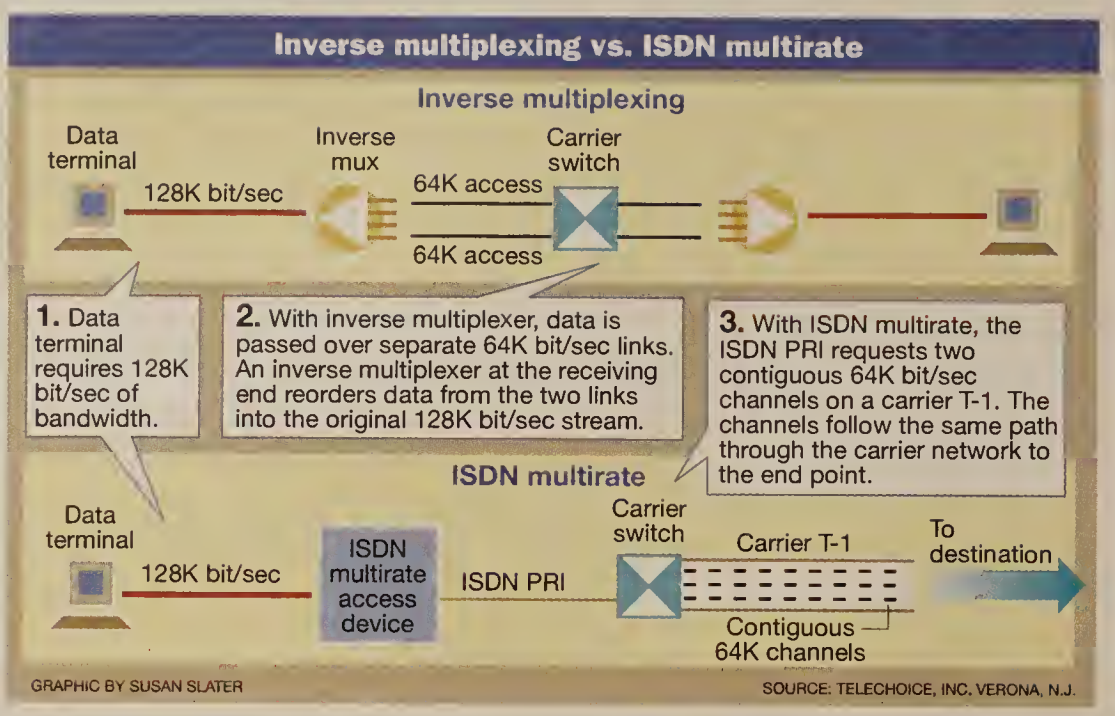
BY CHRISTOPHER FINN

Finn is a senior consultant at TeleChoice, Inc., a Verona, N.J., consultancy. He can be reached at (804) 966-5221 or via MCI Mail at 445-4690.

Continued from page 57

outweighs switched data flows, it will be the voice features that drive the virtual private network selection process.

At the other end of the market are offerings aimed at network managers who have integrated business voice services. For instance, MCI's MCI Vision Data is the data portion of its MCI Vision, while Sprint's Clarity Switched Data Service complements its Clarity product. The major attraction here is integrated pricing and discount plans. These services do not provide as broad a set of features as large virtual private network services.



In addition to bundling switched data with voice, AT&T and MCI also provide stand-alone switched data offerings. However, these stand-alone offerings are not segmented by market. Rather, the carriers offer simple transport with few features and no discounts.

SPEEDY DATA

When you get down to it, one carrier's switched 56K/64K bit/sec offering is the same as any other's. Differences in services start showing up when users have to choose from a few options for obtaining higher speeds.

One option is to tap an inverse multiplexer to spread a high-speed datastream from a terminal device across multiple 56K/64K bit/sec links. Another is to buy a fixed rate 384K bit/sec or T-1 service that complies with ITU-T H0 or H11 standards, respectively. Lastly, users with an ISDN PRI access line can acquire an ISDN multirate service that enables them to request speeds as high as T-1 in any increment of 64K bit/sec at call setup time.

The trade-offs involve weighing the need for costly customer premise equipment and flexibility against ease of use, susceptibility to a single point of failure and price.

Inverse multiplexing provides flexible bandwidth but carries with it the added cost of equipment. The equipment takes a high-speed datastream of 384K bit/sec, for example, from a video coder/decoder, dials up six separate 64K bit/sec links and spreads the data equally across those links.

Each of the 64K bit/sec links can travel a different path through the carrier's network. The inverse mux at the remote site has the task of reordering data from the separate circuits back into the original 384K bit/sec datastream that is then passed off to the receiving codec.

Provided by such companies as Ascend Communications, Inc., Telco Systems Co. and Teleos, Inc., inverse multiplexers can adjust to varying speed datastreams by adding or removing switched bandwidth on an as-needed basis throughout the duration of a call. For example, if one of the 64K bit/sec links used to transfer data between codecs fails, the inverse multiplexer can spread the data across the remaining links while it establishes a new 64K bit/sec switched connection and restores the more equal spread of data across links.

The benefits of inverse multiplexing bring about its downsides. For instance, the equipment needs to be intelligent enough to manage multiple links for the transmission of a single datastream. The equipment robs bandwidth — albeit a small amount — from each circuit to achieve this link management objective. And there is the issue of setting up multiple calls, which can make overall call setup time lag.

Nonetheless, inverse multiplexing can be used with any carrier's switched 56K/64K service. In fact, many carriers are reselling, leasing or renting inverse muxes to customers.

On the other side of the equation are fixed-rate 384K bit/sec H0 and 1.536M bit/sec H11 services that stuff data into contiguous 64K bit/sec channels through the carrier net. AT&T has offered H0 and H11 services for years, while MCI is this week jumping on the H0 and H11 bandwagon.

H0 and H11 services provide a single stream of data across the network and do not require the use of additional equipment. These services are also less expensive than buying the equivalent number of 64K bit/sec links. For instance, AT&T SDDN H0 circuits cost about 25% less than six equivalent 64K bit/sec connections.

But H0 and H11 services represent a single point of failure and require dedicated ISDN PRI access, making them ineffective for smaller sites. AT&T's H11 service requires two PRIs — one for signaling and one for transport. Finally, H0 and H11 limit bandwidth alternatives for multiple applications. If two lower speed applications require a total of 384K bit/sec and one finishes early, then the entire 384K bit/sec connection is still used.

ISDN multirate is the new kid on the high-bandwidth block. This service provides contiguous channels on a T-1 circuit in any 64K bit/sec increment, enabling it to fill the gaps between 64K and 384K bit/sec, as well as between 384K and 1.536M bit/sec. With ISDN multirate, the D channel of an ISDN PRI access line is used to request establishment of a switched link operating at a specified speed (see graphic).

The downside is that ISDN multirate has limited availability today. Currently, only one of the major local carriers — Southwestern Bell Telephone Co. — and two IXCs — MCI and WilTel — offer ISDN multirate. Local carrier NYNEX Corp. has been trialing ISDN multirate and is expected to tariff the service this fall. Other local carriers have not made their ISDN multirate plans public, but because it is based on a Bell Communications Research standard, users can expect more local carriers to roll it out soon.

One important difference between various ISDN multirate offerings is price. WilTel is pricing its service at the same cost of an equivalent number of 64K bit/sec channels. MCI is pricing it lower than the equivalent number of 64K bit/sec channels.

Sprint has chosen not to implement ISDN multirate services at this time in order to focus its energies on what it feels are more important and technically demanding service elements.

"It is just a matter of deploying the switching software necessary to support ISDN multirate in our network," says Sprint's Schneider. "If customer demand for it emerges, we can do it." This keeps Sprint limited to offering 56K/64K bit/sec service at the moment.

When placing international switched data calls, the only current high-speed option other than using inverse multiplexing is AT&T's HO-based 384K bit/sec service. AT&T provides the service in conjunction with the U.K.-based Mercury Communications, Ltd. of London.

NOW PLAYING LOCALLY

Along with speed, service availability is a key issue. There are two questions to ask here: Can I get the service from my local provider, and does my IXC interconnect with all the local carrier end offices that support switched data?

Switched data services can move data 4.5 to 9 times faster than an analog line with a 9.6K bit/sec modem. For instance, a 64K bit/sec switched data link can move a 1,100-page manuscript in about 4 minutes, as opposed to 28 minutes over a 9.6K bit/sec link.

ISDN is seen as the most economical switched data access option available. Although ISDN is continuously being deployed in the local loop, it still falls drastically short of complete coverage. In many cases, ISDN is offered from only a subset of local carrier central offices, and users have usually had to pick up the mileage charge for linking into an ISDN central office.

Enter the ISDN Anywhere concept. In a nutshell, some local carriers are eating the cost of backhauling ISDN circuits to users outside the range of an ISDN central office. That means almost ubiquitous ISDN deployment in certain local carriers' regions — nirvana for ISDN enthusiasts.

"It is not a question of whether this is a new technology," says First Chicago's Kipnis. "The difference is the new approach from the [local carriers]."

And here's what local carriers have to say. "In the past, the RBOCs followed a program of percentage deployment," says Brian Baum, applications manager for network desktop solutions at Bell Atlantic Corp. "For instance, we'd say 65% of all end users would be able to get ISDN in their particular region by the end

of 1994. This didn't fit the mass market."

The other 35% of users were forced to tap switched 56K bit/sec services — usually at a much higher cost.

"Switched 56 was brought out as an interim solution," says Don Roe, product manager for switched digital services and ISDN at Pacific Bell. "It had a much higher availability than ISDN but was more expensive."

As the market moved toward applications — such as telecommuting—that required ubiquitous access, the local carriers realized that the percentage deployment approach toward availability wouldn't cut it. "ISDN Anywhere makes ISDN access ubiquitous," Baum says.

Starting last February, Bell Atlantic began filing tariffs for its ISDN Anywhere service. These tariffs are now effective throughout the Bell Atlantic region.

ISDN Anywhere is the simplest offering available from local carriers. Users in the Bell Atlantic territory pay the same price for ISDN, regardless of how far they are away from an ISDN central office.

Other local carriers offer similar offerings with different twists. For instance, Ameritech provides 100% coverage in six major metropolitan areas and will provide ISDN at no additional cost outside of these areas if the customer requests it.

Southwestern Bell provides a two-tier approach. The local carrier has an ISDN central office in each local access and transport area (LATA). Users within a Southwestern Bell-defined metropolitan area pay one flat rate, while those outside the metropolitan area pay a flat rate that is approximately $60 higher (see graphic).

At the IXC level, availability affects users differently. Some users can connect directly into a long-haul carrier's point of presence (POP) via dedicated T-1 or ISDN PRI lines, which is no problem. Where difficulty arises is when a user wants a local ISDN BRI or switched 56K bit/sec link into a long-haul carrier's POP.

All of the IXCs claim to have aggressive programs for interconnecting their facilities to local carrier end offices supporting ISDN. There are, however, differences among the programs.

The issue is really one of resources. The IXC has to run an ISDN trunk to each local carrier ISDN central office. The Big Three long-haul carriers — AT&T, MCI and Sprint — have more resources and will therefore interconnect to more local carrier ISDN central offices than WilTel or LDDS, which are just starting to deploy switched data services.

DATA SUPPORTER

Once a user knows that an end-to-end switched data link is available in the bandwidth increment required, the issue becomes one of putting the equipment, services and software together to support a specific application.

And the carriers have something to offer here, too. They are offering equipment options as well as technical consultanting to provide applications support and troubleshooting, much to the pleasure of some users.

"We don't need to be on the bleeding edge with our implementation," says David Kurilla, data communications coordinator of Franciscan Health Systems of New Jersey, Inc., a prospective ISDN user in Hoboken. "We want someone to come in and guide us through the whole process to make sure it all comes together. So carrier support is important."

Carriers can approach applications support in a couple of ways. The first is through comarketing agreements with various equipment vendors.

Another way that carriers are striving to support end users is through application centers. These centers are designed to work on a vertical application basis, supporting videoconferencing, LAN-to-LAN connectivity or disaster backup, for instance.

In some cases, these application centers go beyond supporting the use of switched data to include value-added services such as multipoint videoconferencing (see story, page 63).

Some carriers have even segmented their different support groups. For instance, Bell Atlantic has two groups dedicated to switched data application support — one for large users that provides a lot of handholding and on-site support, and one that provides a call-in center tuned to the needs of smaller businesses that buy and build applications on their own.

Ameritech's ISDN Team Data Group, or Pacific Bell's ISDN group are other examples of the type of local carrier application support available to users.

Ameritech's ISDN Team Data Group is a dedicated 30-person staff specializing in vertical switched data applications. By dialing, (800) 832-6328, users can be connected to a specialist who focuses on implementing specific applications that include using switched data for audio compression, disaster recovery, imaging, desktop videoconferencing and document sharing, LAN-to-LAN connectivity, telecommuting or distance learning.

For larger end users, Ameritech uses data and video specialists who travel to customer sites, present the applications, order equipment and services, and do the necessary site preparation.

Pacific Bell's (800) 472-4736 offers similar application support as well as access to comarketing programs. Pacific Bell uses preformatted order processing tools that make it easy for nontechnical users such as telecommuters to buy popular switched data applications that include LAN connectivity, desktop videoconferencing and document conferencing.

In addition to telling users about the availability of ISDN in their location, Pacific Bell's group will assist in getting the service installed and will order equipment.

On the long-haul side, AT&T has its Global Business Video Solutions group for videoconferencing, the SDDN Support Center for Software-Defined Network (SDN) customers, and even a lab dedicated to ISDN testing. Users can come into AT&T's facilities and test a complete ISDN solution from end-to-end prior to putting it into production.

MCI has its VideoNet Help Desk, which provides video applications support, and MCI Developers Lab, which supports integration and interoperability testing for third-party products.

Though generally downplayed by carriers, there are still some interoperability issues users face when implementing applications in which switched data crosses different carrier nets. However, this cross-network interoperability is far better than a year ago.

"In the past four months, interoperability has become much less of an issue," says Greg Nemec, product manager of ISDN at Ameritech. "This is a dramatic change from the situation six months ago."

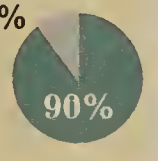
SWITCHING BETWEEN CARRIERS

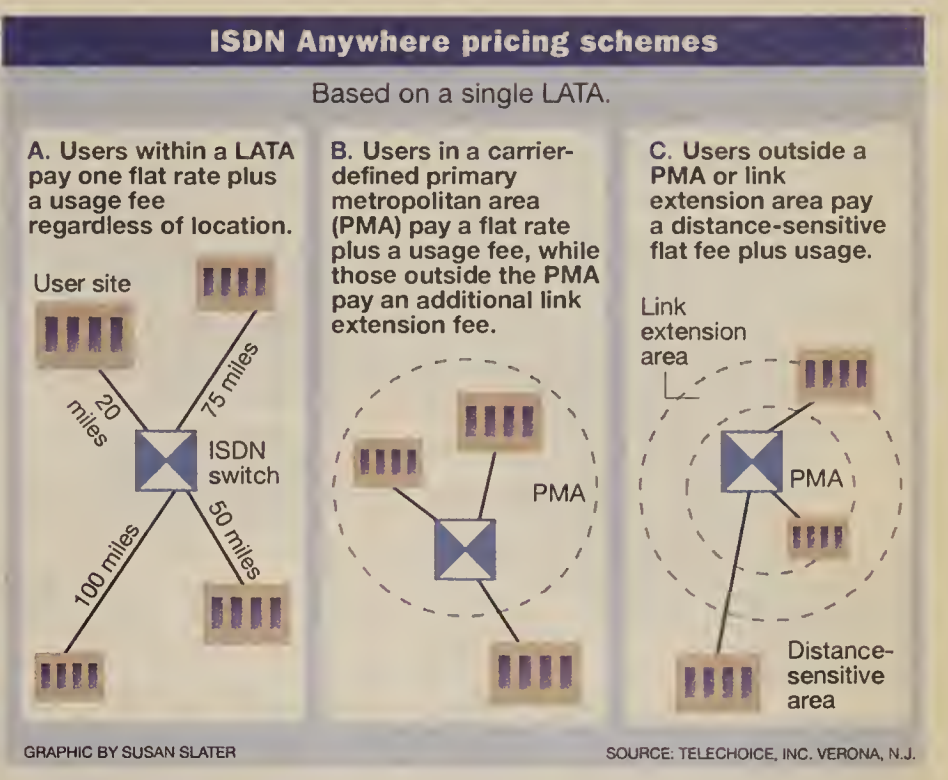
Today, most interoperability issues center around getting different segments of a switched data link to operate at the same speed. A good example is getting 64K bit/sec switched data links to terminate to a site served by Pacific Bell. Currently, the non-ISDN portion of Pacific Bell's network only operates at a top speed of 56K bit/sec. This means users terminating a 64K bit/sec link to a site in Pacific Bell territory must make sure their equipment can downshift to 56K bit/sec.

Pacific Bell helps customers ensure this downshift-

Continued on page 60

Bellcore claims that by year end Bell Atlantic Corp. can tout that it has provisioned ISDN on more than 90% of its access lines, while Ameritech can take credit for ISDN provisioning on more than 80% of its access lines.





Curing data service option paralysis

Users trying to choose a data service today may be faced with option paralysis as they shift through an ever-increasing range of carrier offerings that include Asynchronous Transfer Mode, Switched Multimegabit Data Service, frame relay, fractional T-1 and switched digital data services. However, there are several reasons why switched data services will be the clear choice for certain applications.

Switched data services are best thought of as digital versions of analog dial-up circuits. Switched data services ride over digital subnets in the carrier network and offer many of the same benefits as digital private lines at a fraction of the cost.

For example, switched data services are protocol-independent, offer low and constant delay characteristics as well as guaranteed bandwidth. The major difference is that switched data links are more economical for applications that require short-duration connections on a public network.

ATM, SMDS and frame relay, on the other hand, are based on a different type of switching. In these services, packets or cells are routed among sites via carrier-provided switches. Both ATM and SMDS operate at higher speeds than switched data services and are protocol-dependent, meaning they require hardware and software to format data into predefined packets or cells that can then be switched.

Frame relay operates in the same speed range as switched data services but has characteristics that make it suited to replace traditional leased lines for such applications as LAN interconnection. Frame relay puts user information in variable-length frames that are sent across the network via carrier switches.

Frame relay's variable frame size introduces unpredictable delay into the network, something that makes it ill-suited for the prime switched data application — videoconferencing.

Given that most videoconferences are periodic and short-lived, switched data circuits make more economical sense than a high-speed leased line.

Videoconferencing applications prefer the constant bit rate and delay of a switched data circuit or leased line. Given that most videoconferences are periodic and short-lived, switched data circuits make more economical sense.

In the future, these data services will work together. Carriers are already planning switched data and ISDN services that provide low-cost access to frame relay and ATM networks. This means that a local switched data service could be used to dial in to a port on a carrier's switch for as long as it takes to forward frames or cells into the network. This is analogous to the common practice of using analog modems to dial in to an X.25 value-added network.

BY CHRISTOPHER FINN

Switched digital data services

Company	Services	Speed (Bit/sec)	Access method (D = DDS, IB = ISDN BRI, IP = ISDN PRI, L = Local switched digital, T = T-1, O = Other)	Domestic call billing: Initial period rounding (Seconds)	Domestic call billing: Additional rounding (Seconds)	International call billing: Initial period rounding (Seconds)	International call billing: Additional rounding (Seconds)	Pricing structure: Three-minute undiscounted daytime call: Min. cost/Max. cost	Pricing structure: Based on time of day	Pricing structure: Mileage-based	Discounts: Volume	Discounts: Term plans	Discounts: No. of years term plan is available	POP-to-POP error rate: Errored seconds (Percent)	POP-to-POP error rate: Severely errored seconds (Per day)	POP-to-POP error rate: Error-free seconds (Percent)	Reliability: Call blocking (Percent)	Reliability: Annual availability (Percent)	Equipment programs L = Lease R = Rent P = Purchase: Inverse multiplexer	Equipment programs: Remote LAN device	Equipment programs: Video-conferencing	Equipment programs: Other	Multipoint link
AT&T (800) 222-7956	Global Switched Digital Services	56K, 64K, 384K, T-1	D, IB, IP, L, T, O	30	6	30	6	$.44/ $3.04	✔	✔	✔	✔	3	0.16	22	99.84	<1	99.95	L, P, R	L, P, R	L, P, R	✔	✔
	Software-Defined Data Network	56K, 64K, 384K	D, IB, IP, L, T, O	18	6	30	6	$.72/ $1.80	✔	✔	✔	✔	5	0.16	22	99.84	<1	99.95	L, P, R	L, P, R	L, P, R	✔	✔
	Switched Digital Capability	56K, 64K, 384K	D, IB, IP, L, T, O	18	6	30	6	$.42/ $1.20	✔	✔	✔			0.16	22	99.84	<1	99.95	L, P, R	L, P, R	L, P, R	✔	✔
Bell Atlantic Corp. (800) 236-8018	IntelliLinQ Service	56K, 64K	IB, IP	60	60	NA	NA	$.06/ $.15			✔			(1)	(1)	(1)	(1)	99.9	P, R	P, R	P, R		
LDDS MetroMedia Communications Corp. (800) 929-9559	Switched 56	56K	D, L, T	6	6	30	6	$.306/ $.4275	✔			✔	3	.5	3	99.95	0	99.997	L	ICB	ICB	ICB	
MCI Communications Corp. (800) 933-9029	MCI DataStream for Vnet	56K, 64K, 384K, T-1, ISDN multirate	D, IB, IP, L, T	18	6	30	6	$.588/ $.933 (2)		✔	✔	✔	5	.1 (3)	6 (3)	99.9 (3)	<1 (3)	99.9 (3)			L, P, R	✔	✔
	MCI Vision Data	56K, 64K, 384K, T-1, ISDN multirate	D, IB, IP, L, T	18	6	30	6	$.672/ $.762 (2)		✔	✔	✔	3	.1 (3)	6 (3)	99.9 (3)	<1 (3)	99.9 (3)			L, P, R	✔	✔
Pacific Bell (800) 472-4736	Centrex ISDN	56K, 64K	IB, IP, L, T	60	60	NA	NA	$.07/ $.18	✔	✔		✔	3	<1 (4)	25.92 (4)	99 (4)	<1 (4)	>99 (4)	L, P (5)	L, P (5)	L, P (5)	✔	
	Home ISDN	56K, 64K	IB, IP, L, T	60	60	NA	NA	$.07/ $.18	✔	✔		✔	3	<1 (4)	25.92 (4)	99 (4)	<1 (4)	>99 (4)	L, P (5)	L, P (5)	L, P (5)	✔	
	Primary Rate ISDN	56K, 64K	IB, IP, L, T	60	60	NA	NA	$.07/ $.18	✔	✔		✔	3	<1 (4)	25.92 (4)	99 (4)	<1 (4)	>99 (4)	L, P (5)	L, P (5)	L, P (5)	✔	
	Switched Digital Service 56	56K	IB, IP, L, T	60	60	NA	NA	$.07/ $.18	✔	✔		✔	3	<1 (4)	25.92 (4)	99 (4)	<1 (4)	>99 (4)	L, P (5)	L, P (5)	L, P (5)	✔	
	Switched Digital Service ISDN	56K, 64K	IB, IP, L, T	60	60	NA	NA	$.07/ $.18	✔	✔		✔	3	<1 (4)	25.92 (4)	99 (4)	<1 (4)	>99 (4)	L, P (5)	L, P (5)	L, P (5)	✔	
Southwestern Bell Telephone Co. (314) 235-9800	DigiLine	64K	IB	NA	NA	NA	NA	(6)						<1 (4)	20 (4)	99 (4)	<1 (4)	99 (4)					
	MicroLink I	56K	L, T	60	60	NA	NA	NA/ $.12						<1 (4)	20 (4)	99 (4)	<1 (4)	99 (4)				✔	
	MicroLink II	56K	D, IB, L, O	60	60	NA	NA	NA/ $.20						<1 (4)	20 (4)	99 (4)	<1 (4)	99 (4)					
	Select Video Plus	56K, 64K, 384K, T-1, ISDN multirate	IP, L	60	60	NA	NA	(7)				✔	5	<1 (4)	20 (4)	99 (4)	<1 (4)	99 (4)				✔	✔
	PRI-Smart Trunk Service	64K	IP	NA	NA	NA	NA	(7)			✔	✔	5	<1 (4)	20 (4)	99 (4)	<1 (4)	99 (4)					✔
Sprint Corp. (800) 877-2000	Clarity Switched Data Service	56K, 64K	D, IB, IP, L, T	30	6	30	6	$.5129/ $.8405	✔	✔	✔	✔	3	<4	<1	99.99	<1	99.99	L, P, R	L, P, R	L, P, R	✔	✔
	The Most for Business Switched Data Service	56K, 64K	IB, L	30	6	30	6	$.846/ $.9513	✔	✔	✔	✔	3	<4	<1	99.99	<1	99.99	L, P, R	L, P, R	L, P, R	✔	✔
	Real Solutions Switched Data Service	56K, 64K	D, IB, IP, L, T	18	6	18	6	$.405/ $.711				✔	3	<4	<1	99.99	<1	99.99	L, P, R	L, P, R	L, P, R	✔	✔
	Switched Data Service Premiere	56K, 64K	D, IB, IP, L, T	18	6	18	6	$.309/ $.810	✔	✔	✔	✔	5	<4	<1	99.99	<1	99.99	L, P, R	L, P, R	L, P, R	✔	✔
Southern Pacific Telecommunications Co. (303) 291-1400	SP Telecom-Media Express	64K, 384K, T-1	L, T	6	6	30	6	$.26/ $.70		✔	✔	✔	ICB	.2	<7	99.8	0	99.99					✔
WilTel (800) 642-2249	CustomOne Switched Data Service	56K, 64K, ISDN multirate	IB, IP, L, T	6	6	NA	NA	$.609/ $15.55	✔	✔	✔	✔	.25	.01	8	99.99	.01	99.97				✔	

Products highlighted by color were selected for The Short List.

Chart compiled by Cheri Paquet

DDS = Digital data service
ICB = Individual case basis
NA = Not applicable
POP = Point of presence

Editor's note: Other vendors that were invited to participate but did not respond are Ameritech, BellSouth Corp., Cable & Wireless Communications, Inc., NYNEX Corp. and US WEST, Inc.

FOOTNOTES:
(1) Rates are not measured.
(2) Cost for speeds other than 56K or 64K bit/sec are not currently available.
(3) Rates are based on 1992 figures. MCI refused to provide 1994 rates.
(4) Rates are for the local loop.
(5) Leasing available for equipment that costs $20,000 or more.
(6) Fee is a flat rate of $46 a month or $15 a month and $.25 a minute.
(7) Fee is a flat rate based on the number of 64K bit/sec channels ordered.

Continued from page 59

ing in speed can occur by comarketing equipment that accomplishes the feat. The carrier is upgrading its net to support 64K bit/sec links by the first-quarter 1995.

The same downshifting is required on international switched data links. In Europe, most switched data applications run across links that start at 64K bit/sec and go up in equal increments of 64K bit/sec. In the U.S., 56K bit/sec is still a popular starting point for switched data services.

Another interoperability key is providing a bridge between service providers. Right now, users with dedicated access to an AT&T switched digital service cannot directly dial a site served by an MCI switched digital service. Instead, AT&T must provide a gateway switch that can terminate the call to the MCI site.

The need for a gateway between sites served by different long-haul carriers is not as much of an issue if local carrier access is used. The local carrier simply passes the call off to the long-haul provider that serves the destination site.

For the most part, there are no longer any critical differences between long-haul carriers when it comes to price. Ever since AT&T slashed its switched 56K/64K bit/sec pricing from a hefty premium of approximately 75 cents a minute over voice to a slight premium of approximately 20 cents a minute over voice for large users, most end users feel switched data pricing is reasonable. MCI and Sprint have matched AT&T's price reduction, but each now prices data at a premium over voice.

The biggest news in IXC switched data services over the last 18 months was Sprint's move away from offering data service at the same price as voice. Sprint now charges a premium for data. The move was made as Sprint migrated switched data to its Diamond Network, which carries a 5% to 15% premium over voice.

Sprint might argue that it still provides data for the price of voice because it will enable users to place data calls over its all-digital voice network. But sending data over Sprint's voice network means users don't get the reliability guarantees and other data-specific features of the Diamond Network.

Another trend is the IXCs' willingness to jointly package voice with switched data, which has its benefits but can complicate the buying process.

Switched data group

For more information about joining the Switched Digital Services Applications Forum (SDSAF), send E-mail to SDSAF President Jesse Carter via the Internet at jc8066%omni@swgate3.sbc.com.

Combined voice and switched data offerings provide end users with savings and additional features over stand-alone switched data offerings.

Packaging introduces a tail-wagging-the-dog issue in the decision process. If price is the most important factor, then choosing switched data from the same carrier that provides voice service makes sense.

The Big Three lead the way for packaging for large end users. Under the AT&T SDN, MCI Vnet and Sprint VPN Premiere plans, switched data can be combined with service features to help control usage and establish virtual network switched data dialing plans, but more importantly, switched data usage can be applied toward deeper virtual private network discounts.

For the mid-range users, there are more choices from LDDS and WilTel, as well as Sprint's Clarity and MCI's Vision. AT&T, however, does not yet have a bundled voice/switched data service at the mid-range of the market, although its emerging UniPlan is the logical entry point. All of these mid-range offerings roll voice and switched data usage together to help users achieve deeper volume discounts.

On the local side, the widespread availability of inexpensive ISDN BRI services and uniform ISDN Anywhere tariffs have made local switched data far more affordable than ever before. Without a drop in pricing at the local level, any cost benefit gained from going to switched data for the long haul would be wiped out by high cost access.

"Before Bell Atlantic rolled out its ISDN Anywhere tariffs, we would have had to pay mileage for backhauling traffic to an ISDN-capable central office," says Leonard Small, network consultant for Conrail, Inc., a major rail freight company in Philadelphia. "That [central office] was 25 miles away and it would have cost us $1,000 a month to reach it."

Conrail now uses Bell Atlantic BRI circuits to interconnect AT&T Vistium Personal Video System desktop video units in three communications hubs. If the reaction from users is positive, Conrail will be expanding desktop video links to more remote sites.

Small says Conrail can use Bell Atlantic's ISDN Anywhere tariffs to get BRI service for $35 a month where it was previously cost-prohibitive. For interconnecting sites within a Bell Atlantic LATA, Conrail pays 5 cents per minute. For long-distance links, Conrail uses AT&T, but is yet able to include the digital usage under its Virtual Telecommunications Network Service — also known as Tariff 12 — pricing plan.

"We'd like to use our Tariff 12 for 112K or 128K bit/sec calls, but AT&T has not yet made provisions under VTNS to support digital BRI connections," Small says. "This has forced us to use standard AT&T toll service for inter-LATA calling."

Local service pricing gets even better in large metropolitan areas where competition between regional Bell holding companies and such competitive access providers as Metropolitan Fiber Systems, Inc. and Teleport Communications, Inc. has made dedicated ISDN PRI affordable.

THE FUTURE

Now that the availability and low-cost access issues are finally being addressed, the switched data market is poised to explode.

Computer applications are matching with network transmission capabilities to take the logical step beyond modems to the next higher plan — circuit switched data. And things are about to hit home — literally.

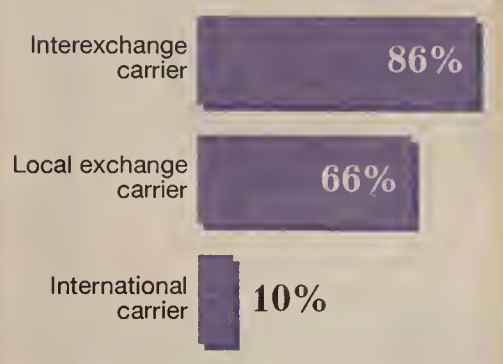
Some network managers will find business opportunities in a digital 800 service that is just

Continued on page 63

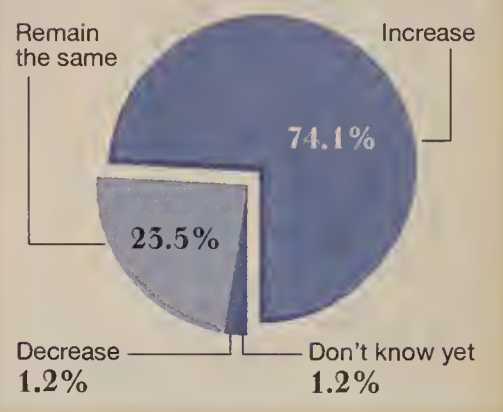
Reader views on switched data services

Based on 100 interviews.

Who provides/will provide your switched data service?
(Multiple responses allowed.)



What will happen to your switched data traffic volume over the next 12 months?



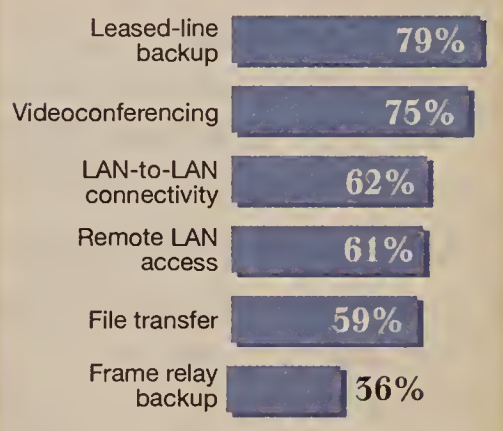
How important are the following factors in selecting a switched data service provider?

	Extremely important	Fairly important	Fairly unimportant	Not at all important
Want switched data available as part of existing outbound voice service.	30.8%	48.3%	9.9%	11.0%
Want same carrier for leased-line and switched data services.	36.7%	38.8%	14.3%	10.2%
Want same carrier for frame relay and switched data services.	27.1%	29.2%	22.9%	20.8%
Want switched data service bundled with carrier-provided application.	19.1%	33.1%	28.7%	19.1%

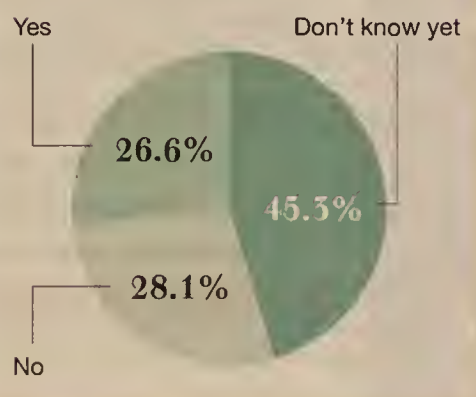
What is the most important criterion in selecting a switched data service provider?
(Highest possible score is 7.)

Geographic availability of service	6.15
Price	5.34
Carrier knowledge of switched data	4.16
Carrier-provided equipment options	4.13
Applications support	3.34
Feature set	2.83
Billing	2.28

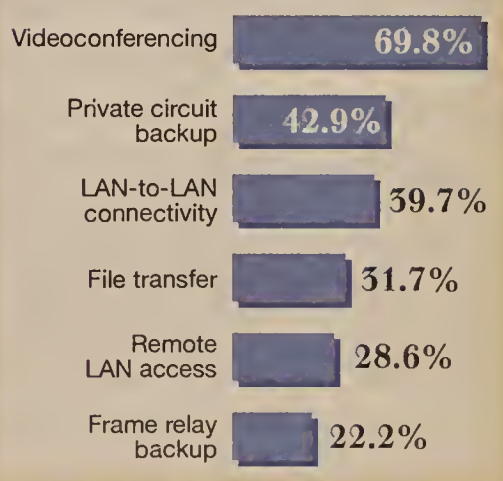
What applications do/will you use switched data service to support?
(Multiple responses allowed.)



Do you intend to replace inverse multiplexers with ISDN multirate service?



For which of these applications do you use/plan to use inverse multiplexing to support Nx transmissions?
(Based on 63 responses, multiple responses allowed.)



Focus Data, Inc., an independent market research firm in Framingham, Mass., conducted this survey. Focus Data specializes in gathering primary data from end-user organizations regarding their enterprise network environment and needs. For more information on Focus Data services, call Mona Dabbon at (508) 626-2556.

NETWORK WORLD SHORT LIST 1994

Switched digital data services

The Short List highlights services Network World *recommends you examine during the purchasing process for switched digital data services. Most users will pick their primary long-haul voice carrier for switched data service in order to get deep usage discounts or are forced to select the local carrier in their region for access. But a few carriers lead in meeting key selection criteria such as offering a variety of speeds, wide deployment and strong support services. Your needs may differ.*

■AT&T

Family of switched digital data services

AT&T provides the widest range of speeds and service support options. For example, AT&T offers basic 56K/64K bit/sec service as well as ITU-T H0-based 384K bit/sec service and H11-based 1.536M bit/sec service, and has a team of experts ready to help users implement switched data applications. AT&T offers switched data as an option to its virtual private network customers as well as on a stand-alone basis. The carrier is also leading the charge into new areas of switched data such as digital 800 services under its WorldWorx platform.

However, AT&T's leadership position is being challenged. MCI Communications Corp. is currently rolling out new, high-speed switched data options. For instance, MCI is scheduled to tariff H0-based 384K bit/sec and H11-based T-1 services, as well as an ISDN multirate offering this month. Rolling out these services could make MCI ready for The Short List next year.

■Bell Atlantic Corp.

IntelliLinQ Service

Bell Atlantic's ISDN Anywhere tariffing makes it the easiest local carrier to deal with in getting ISDN Basic Rate Interface service. Bell Atlantic charges a flat rate for ISDN BRI, regardless of how far the user is from an ISDN central office. The local carrier also has strong support services, with one team of specialists ready to give large users all the hand-holding needed to implement strategic switched data applications and another team that provides slightly more limited support to smaller users. Other local carriers are close on Bell Atlantic's heels, but none have yet caught up.

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The Big Three lead the video support pack

Without a doubt, videoconferencing applications are driving the growth of switched digital data services, and each of the major interexchange carriers has taken notice.

The Big Three now offer videoconferencing-specific switched data services that include everything from basic transmission links to a complete turnkey package of transmission links, equipment and support. These videoconferencing services also provide value-added options that enable different vendors' video coder/decoders to interoperate by converting between the proprietary compression schemes each uses. The services also provide gateways that can link sites using different carriers and different speed links.

These services often facilitate conferences between trading partners and other intercorporate communications. For multipoint conferences, the carriers will provide bridging services, usually based on the ITU-T's H.320 standard, that enable multiple sites to join in a single conference.

Sprint Corp. has the longest record of providing value-added videoconferencing services through its Sprint Video Group, which offers the Sprint Video Select program. Under the program, Sprint offers a wide array of codec conversion and interconnection options. For instance, the carrier will provide users of its network services with connectivity to sites served by AT&T switched digital data services. Sprint will also provide video hardware and software from a number of providers with integrated warranty and service support.

AT&T's Global Business Video Services portfolio offers customers multipoint bridging services, speed and codec conversion, as well as packaged hardware and support, under a single umbrella. AT&T will add videoconferencing service charges to a customer's switched data service bill, providing the convenience of integrated billing.

AT&T will provide connections between AT&T sites and sites using MCI Communications Corp.'s Vision and Virtual Network or Sprint Clarity and Virtual Private Network Services. The carrier also has a single 800 number — (800) 843-3646 — that can be used to reach support personnel or to make reservations for bandwidth and other services to be available at a specific time.

MCI was the last carrier to enter the videoconferencing service market with its VideoNet offering that provides all the functions, equipment and overall application support a user needs. MCI has invested in a standards-based bridging platform for multipoint conferences and provides a fully automated way for customers to reserve both codec conversion services and bridging for multipoint video connections for use at a specific time.

BY CHRISTOPHER FINN

Continued from page 61

making its debut. AT&T has announced digital 800 services under its WorldWorx banner, set for general availability this month. The service will enable customers to dial a company's 800 number and access such data as images of products, or enter orders.

To date, MCI and Sprint are yet to make any official announcements with regards to digital 800 services. But it is likely that both of these companies will provide these services in the future.

"Once you have the network and interconnections in place, providing the service as an 800 call is no big deal," according to MCI's Shaffer.

Digital 800 services will bring to switched data what regular 800 services brought to voice. Users could design more innovative applications, such as on-line retail purchases, distance learning or video technical support. Firms could augment 800 service with images and video, not just voice and analog data.

And enhancements just keep coming out. Pacific Bell, for instance, is rolling out a multipoint videoconferencing service that operates over ISDN or switched 56K bit/sec links.

With all that's been going on, users with data applications who haven't looked at switched data in the past eight months to a year need to reexamine the market. A lot has changed. Applications that didn't work six months ago, work today.

"ISDN and switched data are no longer the Rodney Dangerfields of the telecommunications market," says Franciscan Health's Kurilla. "That's why we are planning to use them to support our data needs."

Langner is a senior consultant with TeleChoice, Inc., a Verona, N.J., consultancy. He can be reached at (201) 239-0700 or at !mlangner@attmail.com.

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A solution for document chaos

SoftSolutions *makes document management easy for users by integrating with familiar applications.*

By Steven Goldberg

The network file server has proven to be the perfect medium for sharing the vast numbers of documents generated by many businesses. Sharing common documents on a file server, however, can quickly become unwieldy.

That's where SoftSolutions document management software from the WordPerfect, Novell Application Group, comes in. SoftSolutions, which we named to our July 18 Buyer's Guide Short List, offers a cross-platform document management system suitable for the enterprise network. We wanted to take a closer look at SoftSolutions 4.0 to determine what sets its apart from other document managers.

Our product probe revealed a solid network application that gives users and managers control over the frequently ignored problem of document mismanagement. The SoftSolutions suite of products go a long way toward providing data security, reliability and management, despite some problems that include poor documentation and a cumbersome user interface.

SoftSolutions integrates with existing applications and performs full-text indexing on documents. It's a tool that can quickly earn the distinctive characterization of mission critical in a suitable environment. The architecture is fairly scalable, fitting the needs of the distributed enterprise, the local workgroup and the laptop-equipped road warrior.

THE CLIENT SIDE

SoftSolutions performs the challenging task of tracking and indexing documents. It integrates with the applications that already reside on a network by hooking into their mechanisms for opening and closing documents. The net result for users is working with familiar applications in a new and unfamiliar way. For most users of average sophistication, however, this should not be a big problem.

Consider, for example, the use of SoftSolutions for Windows with WordPerfect for Windows. When users open a document, they see a SoftSolutions retrieve menu instead of the WordPerfect screen. A call to save a file is intercepted by SoftSolutions via WordPerfect's macro facility. The save process automatically inserts a document in a SoftSolutions dataset, indexes it and tracks certain information about it, including author, date and other user-definable fields. These extra tasks don't add an appreciable amount of time to the save process.

One true beauty of SoftSolutions, and a standard feature in all document management systems, is its ability to handle meaningful file names. The file name field in SoftSolutions is 70 characters long, allowing for tremendous flexibility.

We also appreciated the check in/check out facility. This alternative to portable mode allows a user to work on a document outside of SoftSolutions. When a document is checked out, it is flagged "in use" in the SoftSolutions database to prevent other users from accessing it.

End users can take advantage of different SoftSolutions features in different ways, depending on their skill levels. At the most basic level, users edit in their word processor with a new interface for saving and opening documents, while power users can take advantage of the SoftSolutions Document Desktop features.

The add-on Document Desktop is an intuitive tool for the more sophisticated user. Its drag-and-drop interface allows users to create folders and place documents inside them. Documents that are logically related can be logically grouped together.

THE ARCHITECTURE

SoftSolutions comprises a suite of products that accomplish specific tasks. Among these products are clients for DOS, Windows and Unix, the Document Desktop and multiple server platforms. Client and server platforms are available individually.

SoftSolutions runs over almost any network configuration, regardless of the network operating system being used. All it requires is an ability to map to a network drive. The only personal computer server platform supported is Novell, Inc.'s NetWare 3.1X, via a NetWare Loadable Module (NLM).

Server support comes in the form of Server Enhancement Modules (SEM). These back-end processes are responsible for accepting and processing user requests. This true client/server architecture has apparent benefits for an inherently data-

Continued on page 66

HOW WE *did it*

We installed SoftSolutions 4.0 on a Novell NetWare 3.11 network. The server portion of the application was an NLM. On the client side, we installed the SoftSolutions for Windows client software and the Document Desktop. The entire installation required less than 20M bytes of disk space. We also installed application support for WordPerfect for Window 6.0a and Lotus' 1-2-3 Release 4 for Windows.

NET *Result*

Product:
SoftSolutions 4.0

Key findings:
- Good enterprise solution.
- Client/server is a plus.
- Document Desktop is a nice add-on.
- Poorly documented.
- Could benefit from tighter integration with NetWare.

Client platforms:
- DOS
- Windows
- Unix

Server platforms:
- Novell's NetWare 3.1X
- Digital's Ultrix
- Sun's SunOS
- IBM's AIX
- HP's HP-UX
- DG's DG/UX
- SCO's Unix

Requirements:
- **Client:** 386SX with 4M bytes of RAM
- **Server:** NetWare 3.1X server

Price:
- SoftSolutions for Windows 4.0: $295 per user, plus $495 per server
- SoftSolutions SEM for NetWare: $1,995

Vendor:
SoftSolutions Technology Corp.
625 South State St.
Orem, Utah 84058
(801) 226-6000

Continued from page 65

driven application.

The software can also be used without an SEM, which is good news for non-NetWare sites. Without an SEM, SoftSolutions uses what it calls File Services to communicate with datasets located on servers. File Services boil down to mapping a drive letter to the directory containing the dataset.

The SoftSolutions dataset contains document tracking information, such as author and document title, in addition to a full text index for searching.

The dataset does not, however, serve as a storage canister for the documents themselves. These live in a directory managed by SoftSolutions. Since SoftSolutions manages all access to documents, users never know where the files really live. This design feature has potential benefits for the enterprise manager. Since the dataset is separate from the documents, the two can reside on separate file servers. This might be desirable for improving performance or distributing storage.

INTEGRATE ME

We installed several SoftSolutions products in our test environment. We used the SoftSolutions for Windows client software, the NetWare 3.11 SEM and the Document Desktop, which provides a slick graphical interface to the sometimes clumsy standard Windows interface. The entire installation required less than 20M bytes of disk space.

Applications with SoftSolutions integration

- Calera's WordScan Plus 1.1 and 2.0
- Jurisoft's CompareRite 4.X
- Lotus' AmiPro 3.0
- Lotus' Notes 3.0
- Lotus' 1-2-3 for Windows, Version 1.1, Release 4
- Microsoft's Excel 4.0 and 5.0
- Microsoft Word for Windows 2.0 and 6.0
- Novell's MHS
- Reach Software's WorkMan 1.02
- Watermark's Discovery Edition
- WordPerfect 5.1, 5.2 and 6.0 for Windows

The installation process is fairly straightforward but could be simplified in many areas. First, a rule of thumb for any software vendor: If your software installation requires 15 or more diskettes, offer the option of a CD-ROM. While SoftSolutions doesn't currently have a CD-ROM version, it does offer the option of executing the installation procedure from the network after the disks are copied to a file server.

The installation has both an express and a custom installation option. The custom option gives the installer greater flexibility over what and where SoftSolutions installs.

However, neither procedure is intuitive because they fail to use many familiar Windows conventions such as radio buttons, file selection menus and check boxes.

The process also prompts the installer for a name and password for the SoftSolutions systems manager, who has full access to the entire SoftSolutions environment.

The systems manager must add more users after the installation process or use a SoftSolutions utility to import users directly from the NetWare bindery. This process is DOS-based, however.

While the utility does import the NetWare password, users must reenter it every time they launch the SoftSolutions client. We would like to see SoftSolutions offer the ability to read the NetWare bindery directly.

The other important task of the installation process is choosing which applications to integrate with SoftSolutions. SoftSolutions can integrate with a broad set of Windows applications (see graphic).

The integration process modifies the initialization (.INI) files of the given application and installs a series of application-specific Dynamic Link Library and custom macro files for each application. These changes enable users to access SoftSolutions through native commands. These file updates are made for users during the client workstation portion of the setup procedure.

After we chose our applications, we quickly and painlessly installed the Document Desktop, SoftSolution's graphical interface product. The Document Desktop files are copied to the SoftSolutions program directory on the network.

When a user runs Document Desktop for the first time from the Windows File/Run menu choice, the application sets up the client workstation. All necessary files are copied to the client, and the client's initialization files are modified.

On the server side, we installed the backend SEM on our NetWare 3.11 file server. The NLM installation procedure is a manual process and could benefit from a simple customization program. We were required to copy the SEM files to the file server and edit a configuration file that pointed to our SoftSolutions directory on the network. The NLM requires 400K bytes of file-server memory.

The SEM file-server console screen displays pertinent information about SoftSolutions usage, including user connection and packet information. The SEM also records relevant information in a SoftSolutions log file. This file comes in handy when troubleshooting a problem.

The SoftSolutions SEM can work with NetWare's Transactional Tracking System (TTS). TTS tracks all file-server user activity for files flagged by an administrator. In the event of a file-server crash, TTS can rebuild these files. While TTS has clear benefits, it does impact file-server performance. Unless you have memory to spare, carefully consider whether to use TTS.

Throughout the installation, we were confronted by the poor quality of the SoftSolutions documentation, which is the Achilles' heel of this product.

The biggest problem with the documentation is that it does not have a logical beginning. There is no comprehensive overview and no clear road map to guide a user or manager through the application's many facets. For example, the term "dataset" is eventually defined, but the reader is presented with few guiding principles about its usage.

CUSTOM TAILORING

With all of the pieces in place, we set out to configure the document management system for use. The software can be used without a great deal of modification, but most environments will want to take advantage of the system's flexibility.

We began customizing our environment by configuring our test dataset. We elected to track billing information, a feature that's useful to service-oriented organizations. SoftSolutions allows for either an hourly or a per-page billing rate.

SoftSolutions' replacement for Lotus 1-2-3's Save As dialogue box.

The system has an extensive report-writing feature, which makes the generation of bills a breeze. Users can define reports that show, for example, documents listed by author, document types and system usage by users.

We also configured the datset for security and version control. SoftSolutions can allow specific users or groups of users access to selected documents or document categories. Security can also be disabled, allowing all users access to all documents.

Version control allows for as many as 99 versions of any document to be saved, a real plus for use with documents that are edited by several people. The system tracks document usage in many ways, including by document date, time and user name. With version control enabled, SoftSolutions compiles an audit trail detailing the life of a document.

We also activated SoftSolutions' portable mode, which lets users run the software without having direct access to a dataset. This is useful during file-server crashes and for laptop-equipped users. When these users have no access to the server, they can still work on documents using a local dataset.

Once the user's connection to the server dataset is restored, the user must synchronize the two datasets. This operation is reminiscent of a Lotus Development Corp.'s Notes replication but not as slick. Portable mode is critical in expanding SoftSolutions across the enterprise.

When documents are added to SoftSolutions, only an index of the full text is stored in the dataset. The actual document resides in a network directory and is managed by SoftSolutions.

The process of indexing the full text of the documents is delegated to an external indexing process. While the indexer can be nondedicated, SoftSolutions recommends using a dedicated workstation. The indexer must also be run by new organizations on their existing document base, a process that can take hours or days, depending on the number and size of the documents.

In dedicated mode, the indexer runs under Windows and waits for new documents to be added by users. Once added, the indexer processes the document and adds the information to the dataset. It is then immediately available for searching by users.

For sites using a nondedicated indexing machine, full text searching is not available until the process is run.

In a production environment, SoftSolutions requires ongoing maintenance. The SoftSolutions index must be maintained, and managed files must be archived and backed up.

In our test environment, our dedicated indexer performed well, with just a few errors. One snag, noted as a problem in the documentation, occurred when the indexing process attempted to index a WordPerfect document that was password-protected. A log file was generated, and the problem easily corrected. When the indexing process encounters an error, it holds the file aside and automatically attempts to reindex every three hours until the problem is resolved.

SoftSolutions includes utilities to manage the index file. The compaction utility, run bimonthly by the administrator, removes "dead space" resulting from document deletion. The utility must be run during off-hours because users cannot be connected to the system while it runs. In case of errors in the index, SoftSolutions ships a utility to reconstruct the database.

The archival and deletion of documents works with SoftSolutions' feature-packed report writer. Files can be designated for archiving or deletion, with deletion removing all trace of a managed document, including references in the SoftSolutions index.

Archiving is a middle step that moves a file out of the current dataset to another location. If a user tries to access an archived file, SoftSolutions looks for the file in the alternate location. If the file does not exist — as is the case, for example, when it has been backed up and deleted by a hierarchical storage management routine — a request is sent for the administrator to restore the file.

THE BOTTOM LINE

SoftSolutions is by no means perfect. Its ease of use could be improved, as well as its ties to NetWare. Novell, with its WordPerfect and SoftSolutions subsidiaries, has the ability to tightly bind its network applications into a more cohesive offering. We look forward to future product releases that exploit this advantage.

Goldberg is a network analyst at Neighborhood Health Plan, a Boston-based HMO. He can be reached at sgoldberg@vax.clarku.edu.

Network Innovators

Network pioneer

Douglas Engelbart

breaks the barriers between man and machine

BY STAN KOLODZIEJ

CINDY CHARLES

Keep your radical computer network proposals to yourself or you might remain an assistant professor the rest of your life. That was the warning electrical engineering graduate student Douglas Engelbart received from his senior colleagues at the University of California at Berkeley in 1955 when he first presented his concept of interactive computing.

Thankfully, Engelbart did not keep his ideas to himself. The network pioneer went on to become instrumental in the study and conceptualization of modern interactive computing. His development work led to some of the concepts behind groupware and windows, the creation of the PC mouse and other innovations that are standard fixtures in today's commercial network environment. Engelbart was also one of the driving forces behind ARPANet, the first national computer network that has grown into the international phenomenon known as the Internet.

It wasn't an easy road at first. In the early 1950s, interactive computing was no more than a radical concept. The only computers in existence were gigantic calculating machines. Engelbart's suggestion that these awkward devices could interact through hypothetical networks and become more than just number crunchers was considered strange and even heretical. Despite scorn and skepticism, Engelbart remained convinced that the interactive use of computers could elevate the "collective knowledge" of society and produce new ways of advancing mankind.

Seeking a more receptive audience for his avant-garde interactive computing theories, Engelbart aligned himself with the Stanford Research Institute (SRI), a nonprofit organization based in Menlo Park, Calif., shortly after graduating from Berkeley. Between 1957 and 1959, Engelbart labored on some interesting but fairly conventional research including magnetic computer components, the study of digital devices and miniaturization scaling. All the while, Engelbart's visions of an interactive work environment were kept on a back burner because although SRI was sympathetic, the group lacked the necessary funding. This roadblock was lifted, however, in 1960, when an unlikely white knight came forward with the seed money to sponsor Engelbart's own research lab at SRI.

At that time, the Air Force, like other areas of the U.S. military, was in an arms race with the Soviets and was not about to overlook potentially beneficial research to keep ahead of their Cold War enemies, no matter how farfetched an idea appeared on the surface.

"The Air Force was specializing in low-probability, high-risk endeavors," Engelbart explains, "And the concept of interactive computers qualified."

A rose by any other name

Engelbart and his colleagues created a replacement for computer keyboards originally known as the X-Y plotter. When an SRI researcher commented that the wire emerging from the end of the device made the tool resemble a mouse, the name stuck. Hence the ubiquitous PC mouse was born.

INNOVATIONS

With the sponsorship came several years of important research freedom, which Engelbart judiciously used to refine his theories. Then in 1962 he published the sum of his precepts in the paper, "Augmenting the Human Intellect – A Conceptual Framework."

For the next 20 years, the lab's work followed the report guidelines, which outlined concepts such as videoconferencing, sharing files and the formation of the network operating systems necessary in interactive computing.

Among the other innovations that emanated from Engelbart's SRI lab were display editing; the interaction of text, graphics and video to create an early form of computer multimedia; and groupware, including shared-screen teleconferencing and computer-supported meeting rooms. These and other innovations became part of an interactive working environment the SRI lab named oNLine Systems (NLS). Engelbart describes NLS as "an extensive system of computer aids evolved to supply a coherent, comprehensive environment in which knowledge workers could do all of their central, everyday work."

Tymeshare, Inc. purchased Engelbart's NLS concept from SRI and made it the core of the company's office automation division. Following the purchase of Tymeshare by McDonnell Douglas Corp. in 1984, Engelbart worked closely with the Aerospace Components Division of the manufacturer. He developed integrated information systems architectures that defined many of the tools and concepts of NLS.

ARPANET

Another major step forward in Engelbart's career occurred with the appearance of J.C.R. Licklider, a researcher who had left the Cambridge, Mass.-based consultancy of Bolt, Beranek and Newman in 1967 to work at the Department of Defense's Ad-vanced Research Projects Agency in Washington, D.C.

Licklider, a research psychologist, became a major sponsor of Engelbart's time-sharing research at SRI. The essence of this work, which involved network contention issues, links with LANs and interactive file transfers, would eventually find use in the spread of interconnected LANs and WANs in the network marketplace of the 1980s, and now into the 1990s through the Internet.

Engelbart credits the ARPANet project as being a major turning point in his research.

"You can theorize about ways for people to try and handle knowledge more effectively in their own computer environments, but how do you theorize about people collaborating?" he asks. "ARPANet for the first time gave us the ability to create and study a community of people that accessed, worked on and shared the same kinds of data."

> *"We're constantly running across people who want to plow the same [network] fields that Doug's already gone over – he's that original."*
>
> **David Carter**

SINGULAR DETERMINATION

Friends say Engelbart brings the same sort of determination to his outside life that he does to his work. They attribute his defeat of abdominal cancer several years ago as much to sheer willpower as chemotherapy.

"When he tackled his illness, he did it the same way he tackles his research," explains David Carter, a project manager at McDonnell Douglas who worked with Engelbart. "He first visualized the health in his body and then tried to augment it. And part of the way he did that was through unconventional methods such as acupuncture and the power of positive thinking. It demonstrates his nontraditional way of thinking," Carter says.

Today, Engelbart runs the Bootstrap Institute, a consulting group he started in 1990 in Fremont, Calif., to help organizations install and implement leading-edge network technologies.

"We try and change organizations to the extent necessary for them to harness the capability for change," according to Engelbart.

"There's a term called lost opportunity cost," he continues. "When PCs first appeared, it took another decade before the networking of those machines was taken seriously. That was a lost opportunity for society. If my work in some way can help prevent other such lost opportunities somewhere, in some way, I'll consider it all worthwhile."

Kolodziej is a Boston-based free-lance writer.

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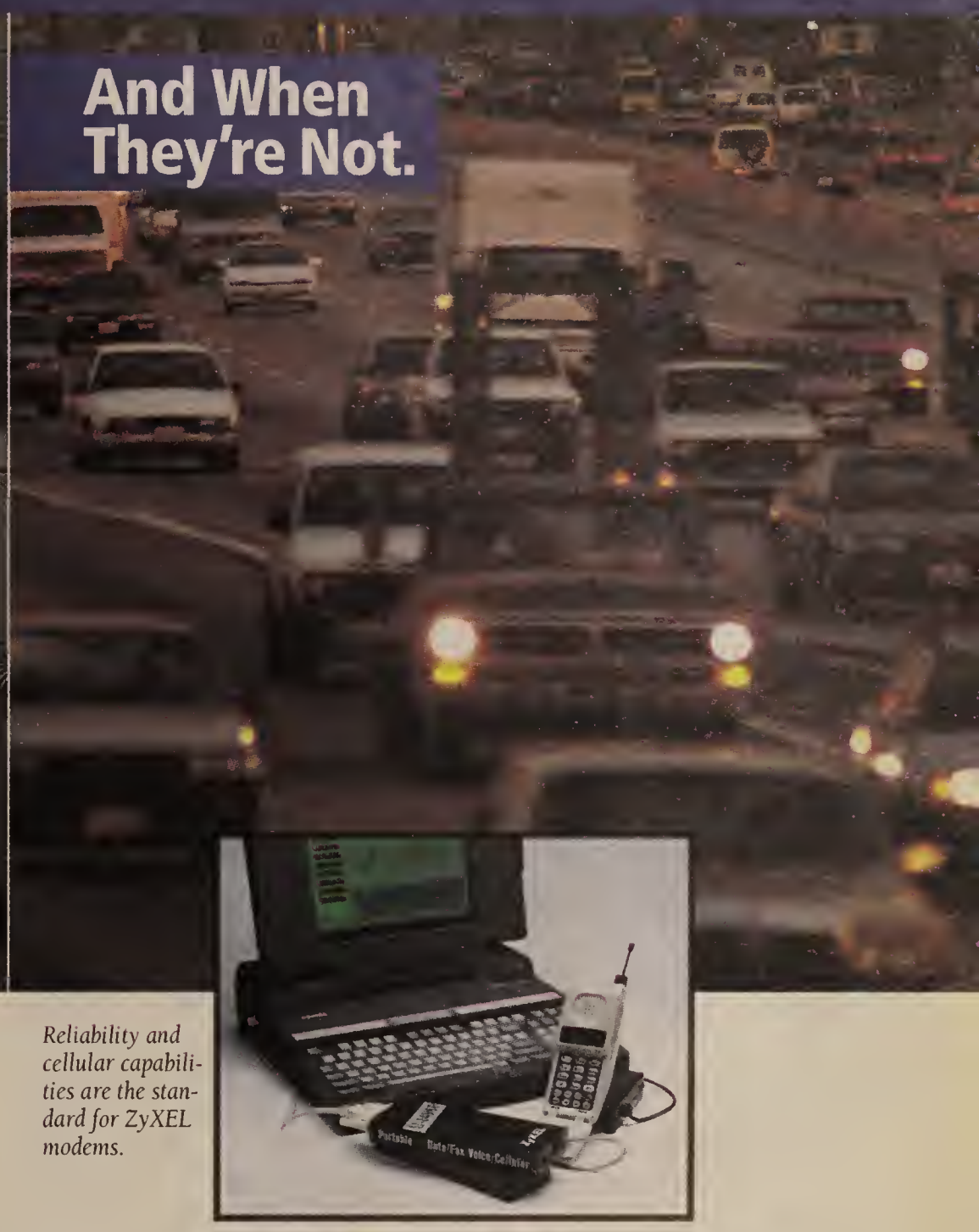

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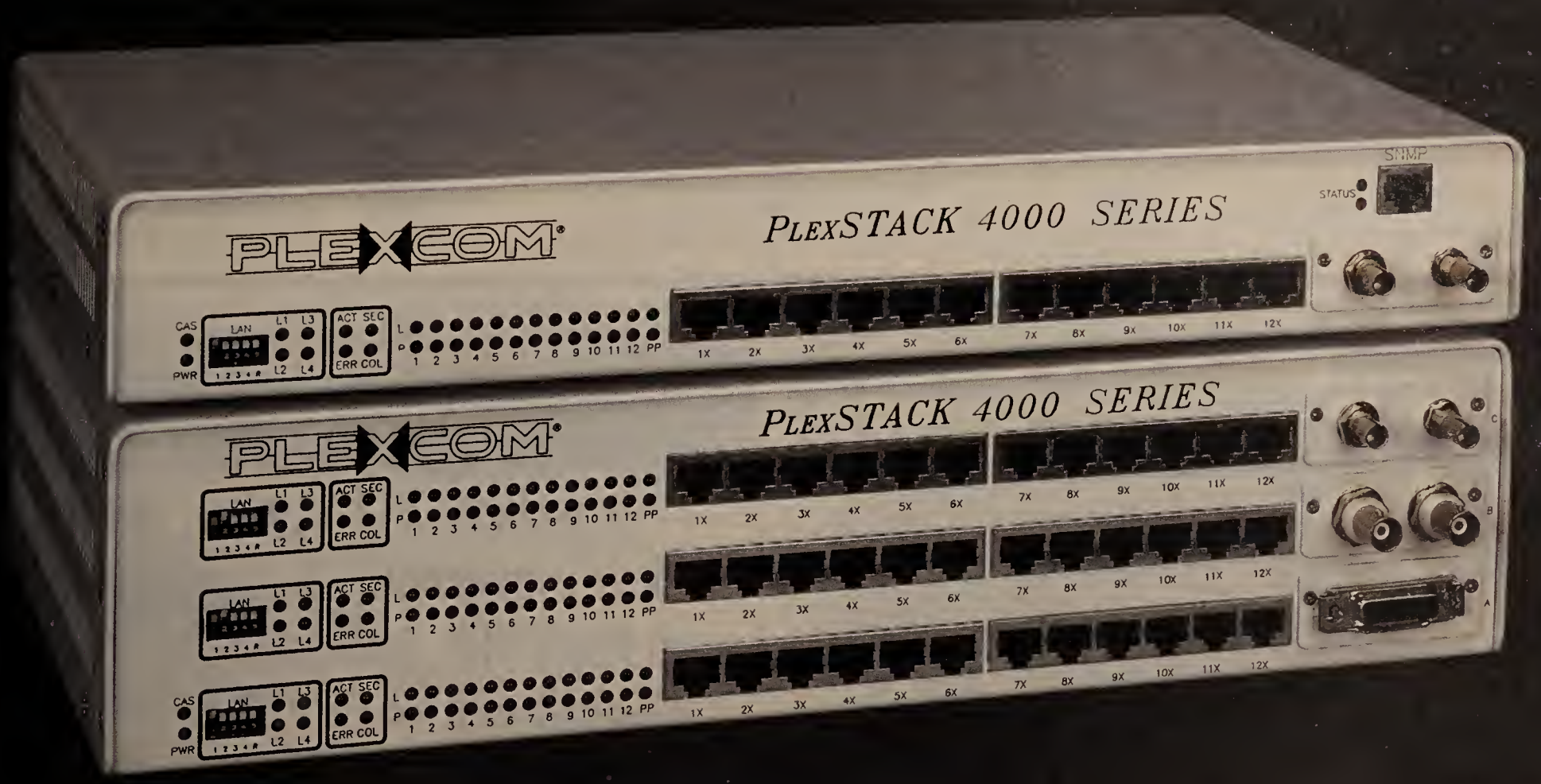

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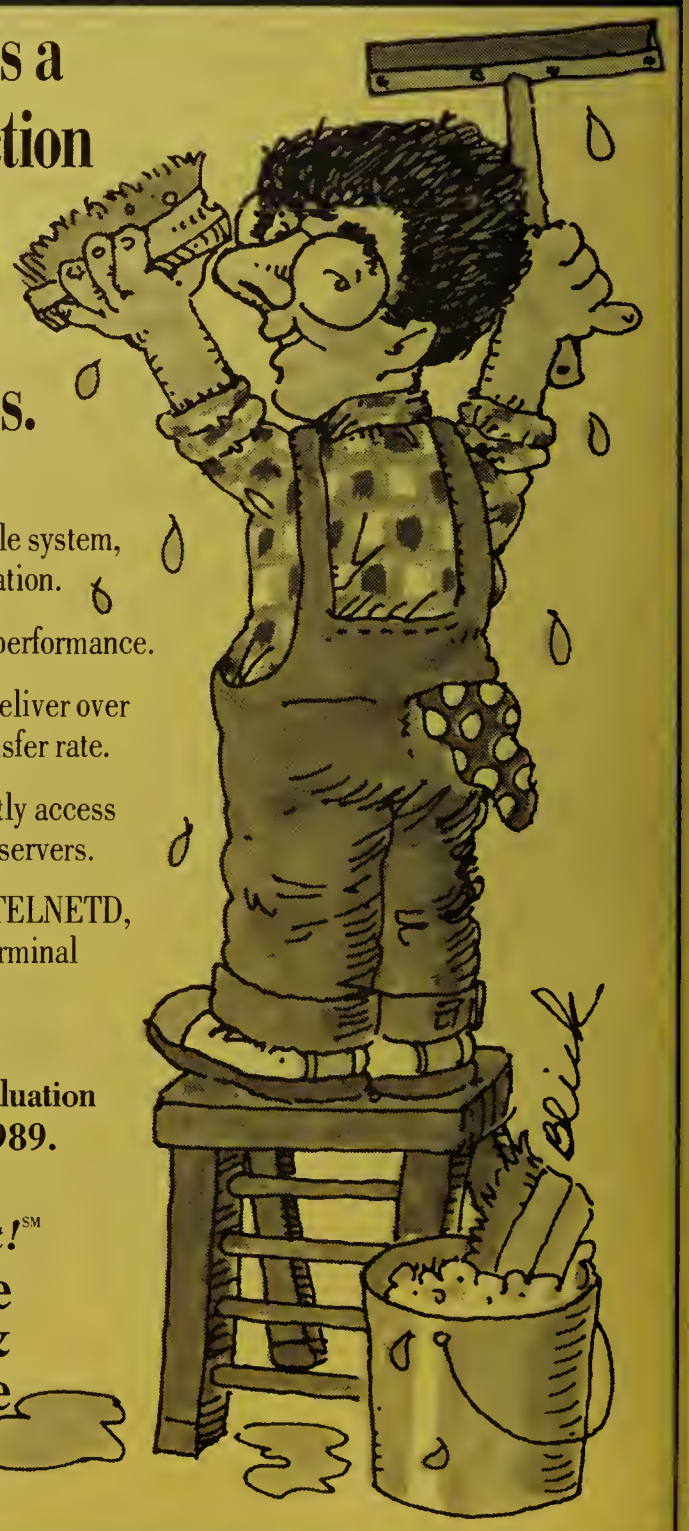

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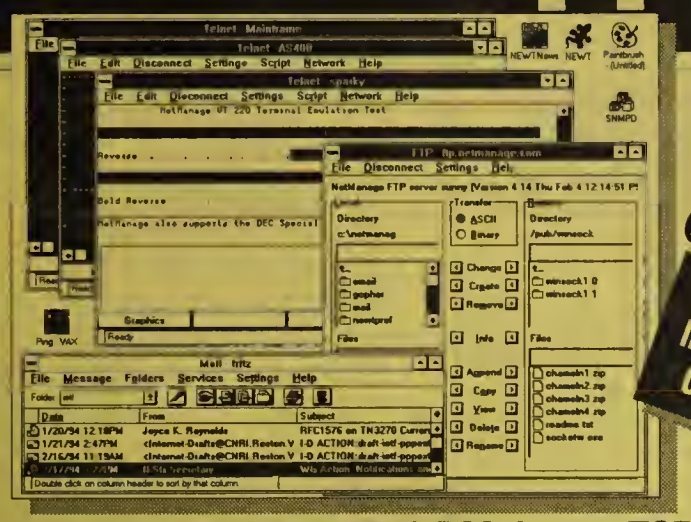

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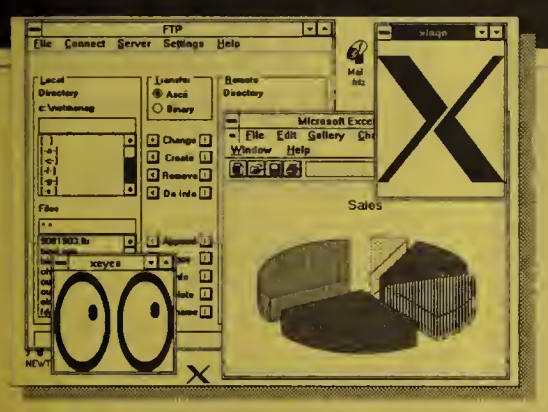

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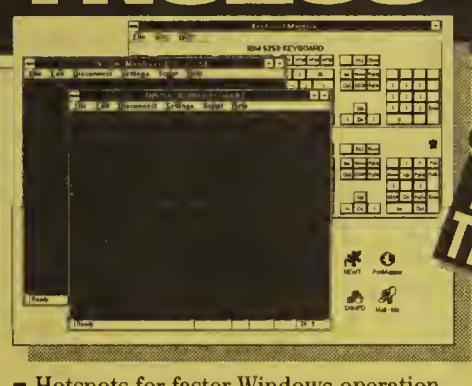

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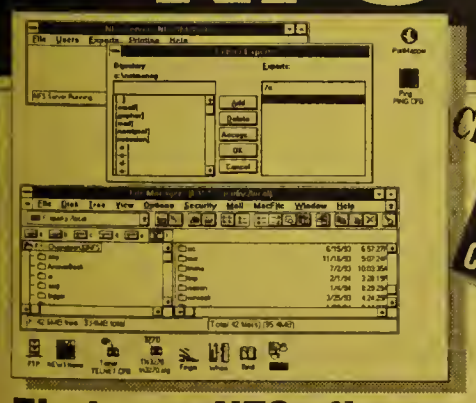

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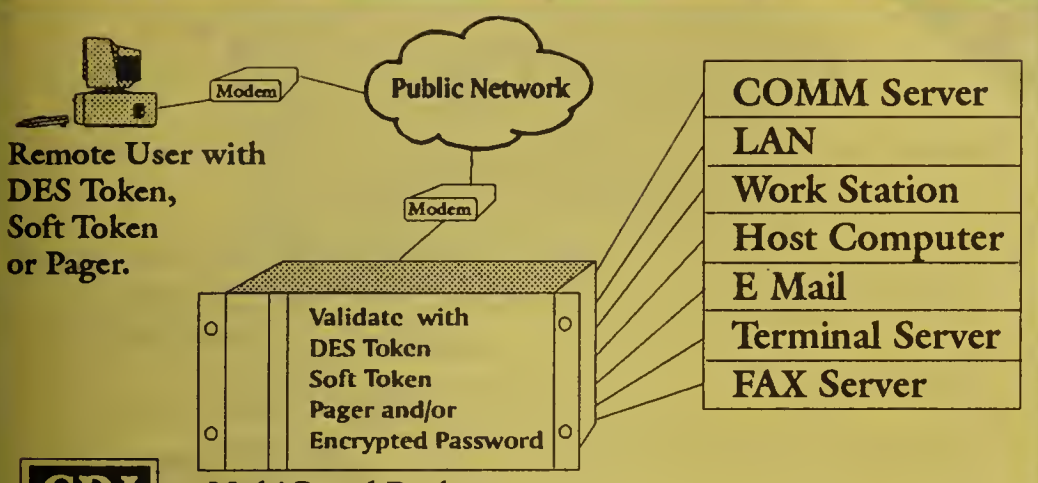

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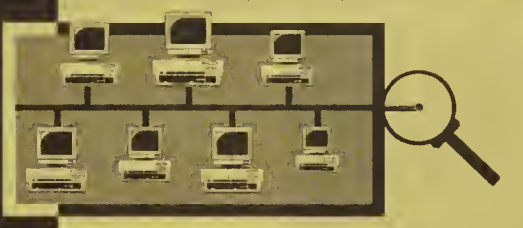

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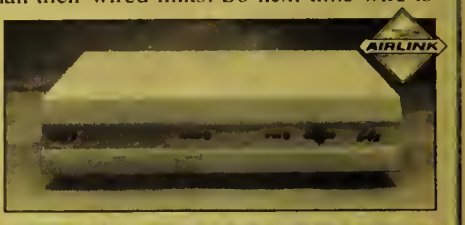

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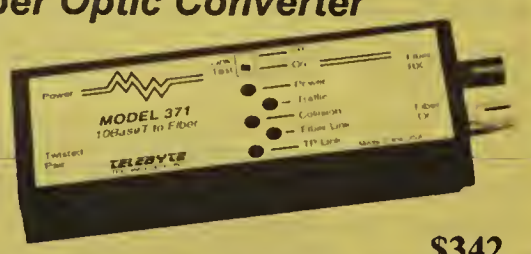

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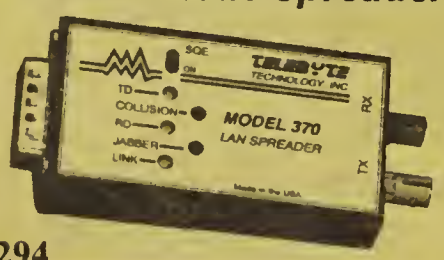

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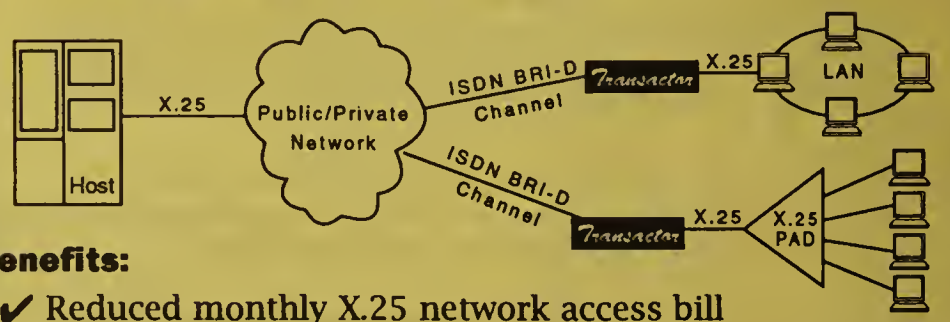

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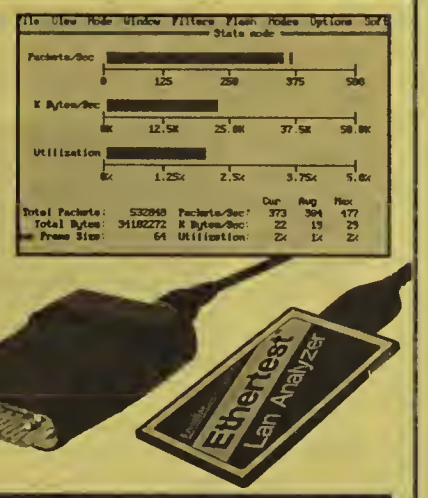

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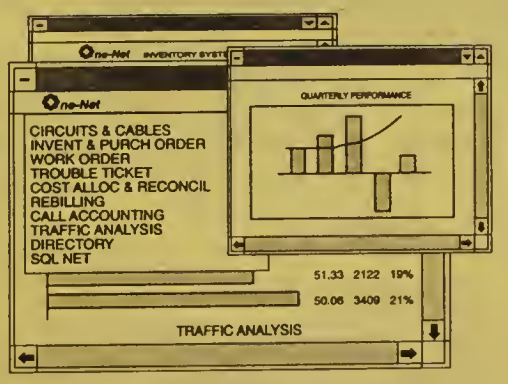

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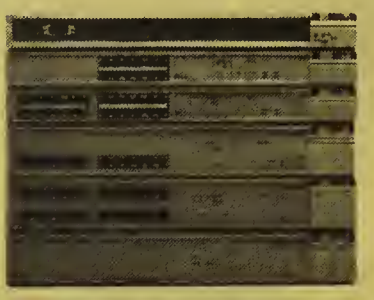

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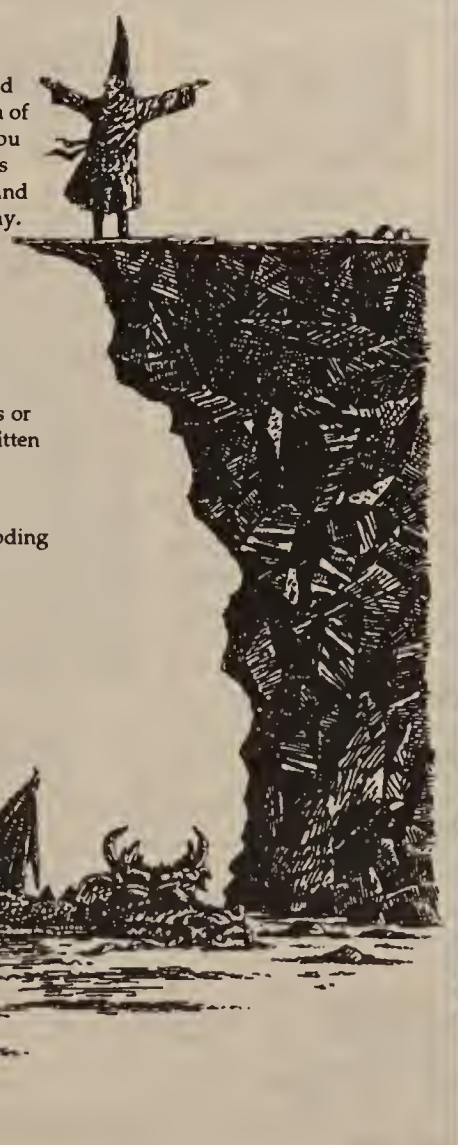

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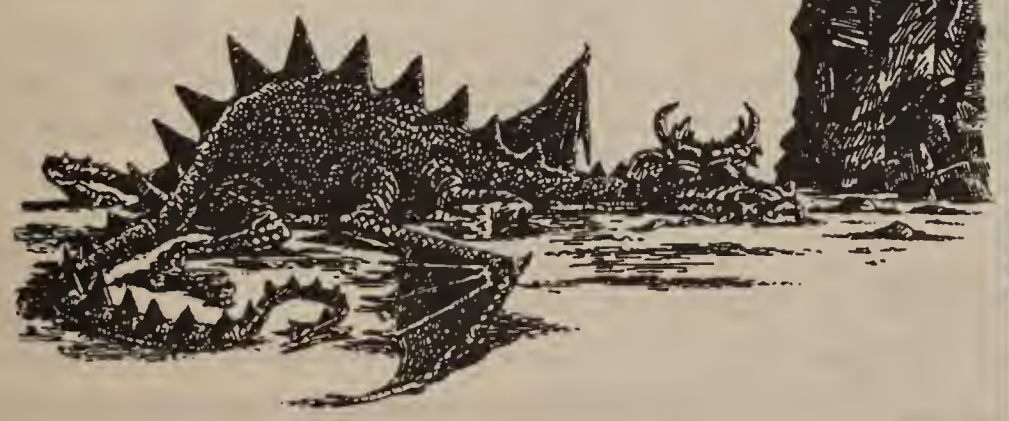

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Unisys, Sony

Continued from page 6

soft's OLE 2.0 specification for linking applications.

By mid-1995, Unisys will ship an H.320 ISDN-based version of the product that will work with other H.320 video products on the market, according to Reno Davenport, videoconferencing market director at the company.

"Once the ISDN software and card are added, users will be able to videoconference over either TCP/IP or ISDN using the same PC," he said. But the Unisys video product will not support videoconferencing with any H.320-based system, including the one from Unisys itself.

The Unisys product costs $12,995 per desktop, which is somewhat steep, analysts said. "This may sell in companies that don't already have their 486 PCs in place," said Dave Yokelson, analyst with META Group, Inc., a consultancy in Westport, Conn.

San Francisco-based carrier Communications Broadband Multimedia, Inc. (CBM), which has successfully beta-tested the Unisys system, liked the fact that it comes preconfigured and is using it internally.

The company plans to start up a nationwide switched desktop video network — in which the product will be used — in coordination with MCI Communications Corp. and Teleport Communications Group.

DAVENPORT

JUST WHEEL IT IN

In the meantime, Sony will wheel out its first entry in the rollabout video market with the Trinicom 2000, designed to support viewing by two to six people per site.

The Trinicom 2000 comes with a 27-inch monitor and can be moved from room to room as needed. The system has a wireless audio unit containing a microphone, speaker and amplifier. A small portable control panel called the Remote Commander wirelessly operates all the Trinicom 2000 video functions.

Trinicom, which starts at $24,975, supports up to 15 frame/sec. Sony is also offering a graphics board and drawing tablet for document and still-video transmission and annotation. The Trinicom 2000 can also double as a typical color TV with a VCR.

✆Unisys: (408) 434-2159; Sony: (201) 930-7454.

Workflow

Continued from page 6

because I now have a middle layer of workflow under them," Price said.

Workflow scripting tools lack the sophistication needed to let users build their own data modeling or analysis applications, Price said. "I need them to give me the sockets, give me the tools to do that," he said.

Unlike other applications, which may need to talk to electronic mail or database software, workflow applications lie like a blanket across an entire network and have to be integrated with most other applications, said Gerry Murray, an analyst at Framingham, Mass.-based market research firm IDC/Avante, the show's sponsor.

Existing links to databases and other applications are often inefficient and eat up bandwidth with poorly designed network methods, said an IS manager for a large trucking company. "We're looking for something that can connect to all of our applications and database in AS/400 without hammering our network," she said.

Users with Apple Computer, Inc. Macintoshes in their networks have an even harder time with integration, said Lawrence Sewell, computer systems lead engineer of Virginia Polytechnic Institute and State University in Blacksburg.

The university is trying to build a workflow system to link its 3,000-person administrative staff, which uses Macintoshes and Windows- and Unix-based systems. It cannot find one that works with all three.

"Most vendors are targeting the 80% or 90% of the market that's on Windows," Sewell said.

"Most vendors are targeting the 80% or 90% of the market that's on Windows," Sewell said. Many products run on Unix because they use it as a server platform, but only Digital Equipment Corp. and one or two other vendors support Macintosh, he said.

Workflow applications also need to support more layers of security, or integrate with existing security systems, before they are ready for enterprisewide deployment, Sewell said. He is evaluating the Kerberos for security but has not yet found a workflow application that can work with it.

Technology aside, the difficulty of identifying and building detailed models of work processes is holding up wide acceptance of workflow applications in large organizations, said Dennis Murray, senior analyst in charge of collaborative technology at East Hanover, N.J.-based Sandoz Research Institute, a subsidiary of pharmaceutical giant Sandoz Pharmaceutical Corp.

The parent company is considering linking its worldwide operations with a giant workflow system, but cultural differences are holding up the evaluation process.

It is hard enough to identify and model processes within one department or an organization. It is vastly more difficult to do that in an enterprise that spans several geographic regions or countries, where local differences, including language and culture, can confuse things, Murray said.

There is not much technology can do to solve cultural differences, but workflow vendors need to deliver tools that make large-scale workflow modeling — that includes both structured and ad hoc workflow capabilities — easier to build, Murray said.

GTE

Continued from page 6

ter, with 1.25G bit/sec capacity. Two PathMasters can be stacked to double that capacity. As traffic needs increase, a core shelf can be added to support as many as 16 PathMasters for up to 10G bit/sec nonblocking capacity.

A PathMaster could be used as a campus switch, linking Asynchronous Transfer Mode LANs to one another and to the wide-area backbone. Core shelves would be added at major backbone nodes to increase their switching capacity.

While most private networks would be satisfied with smaller configurations, carriers will have the option of adding the StatMaster, which provides 8-to-1 concentration of user traffic at access points. By statistically multiplexing all traffic, a 10G bit/sec node could support 80G bit/sec of access traffic.

Most private campus switches will not need more than 2.5G bit/sec of capacity, Sevcik said. "Because they've designed this architecture to mix big switches with small ones at different interface rates and traffic densities, they've had to solve a lot of congestion problems from the start," he added.

Most private campus switches will not need more than 2.5G bit/sec of capacity.

GTE also had the experience of its first-generation switch on which to build. MCI Communications Corp., for instance, found NTI's version of the switch to be lacking in buffer capacity.

Each 622M bit/sec (OC-12) switch port now has an 8,000-cell buffer shared by one constant bit rate and three variable bit rate queues. Each virtual circuit passing through a queue can be prioritized according to 20 different parameters, which provides flexible class-of-service provisioning.

Among competitors, only StrataCom, Inc. has a similar design with its modular BPX that handles as many as 32 classes of service. The BPX can scale from 10G to 20G bit/sec. "We have not discussed anything beyond that, but it could be scaled both up and down," said Stan Kramer, StrataCom's broadband product-line manager.

Pricing for StrataCom's BPX starts at $28,000 for a 10G bit/sec chassis.

The SPANet G2 system will cost $40,000 for a 1.25G bit/sec PathMaster with two user cards and one network trunk card. Napier said GTE has not settled on a price for its 5G and 10G bit/sec core shelves. Each PathMaster shelf has eight slots available for line cards.

GTE will offer single and dual PathMaster shelves in June. Next December, GTE will add 5G and 10G core shelves that support interface ports up to OC-12. StatMaster concentration modules will also be available at that time.

NTI will not resell the SPANet G2. Company officials said NTI will resell the SPANet G1 while developing the next-generation Magellan Concorde switch.

✆GTE: (617) 449-2000.

Wellfleet

Continued from page 1

The router will handle Ethernet, token-ring and Fiber Distributed Data Interface LANs as well as a variety of synchronous WAN interfaces, including frame relay and ISDN Basic Rate Interface. The WAN link maxes out at T-1/E-1.

Future enhancements include integrated Asynchronous Transfer Mode and ISDN Primary Rate Interfaces.

Wellfleet confirmed that it will announce a new product this week but declined further comment.

The Access Stack Node will support the same suite of routing, bridging and network protocol software as other Wellfleet routers such as TCP/IP, DECnet Phase IV, IPX, AppleTalk and XNS, and algorithms such as Spanning Tree Transparent, Source Route Bridging and Data Link Switching. Each router features throughput of 50,000 64-byte packet/sec.

That performance, typical of mid-range devices, at first confounds users looking for a low-end offering to complement Wellfleet's current mid-range device, the Link Node.

"If it's the same old thing [as Wellfleet's Link Node devices] but just smaller, it's a little late," said Timothy Pletcher, assistant director of networking at the University of Michigan in Ann Arbor. "It better be something different than the LN."

But analysts say the configuration flexibility of the Access Stack Node will not disappoint.

Reality Check

Product: Access Stack Node
Company: Wellfleet Communications, Inc.

The benefits:
- Routing ports and processors can be added as needed.
- Supports Wellfleet's high-end software suite, including DLSw.
- Low cost.

The drawbacks:
- SPEX bus extender requires a dedicated slot and external connectors.
- Connection between routers is only 200M bit/sec.
- Broadcast storms will pass from one router to the next in a stack.

The user view:
"The old Link Node wasn't very flexible, and it was pretty expensive."
Timothy Pletcher

"This is a good thing, they've actually done a good job," said an analyst who requested anonymity. "It provides an interesting new spin on the mid-range that gives you cost and flexibility benefits."

Though it's a new spin, the Access Stack Node is based on the same symmetric multiprocessing architecture as Wellfleet's Backbone Node router. This architecture is based on a central processor interconnect bus, called the Parallel Packet Express, that connects the LAN and WAN interface modules to packet processing modules called Fast Routing Engines.

According to analysts, the Access Stack Node will go up against Cisco Systems, Inc.'s 4000 series device, which is also touted as a mid-range offering that can be deployed in remote offices as well as regional sites. The 4000 is a three-slot device with a throughput of 14,000 packet/sec and an entry-level price of $6,400.

But the difference between the Access Stack Node and the 4000 is scalability through stackability. When four Access Stack Nodes are linked together through the SPEX interface, throughput is pumped up to 200,000 packet/sec.

Cisco's 4000 is not a stackable device.

Pricing for Access Stack Node starts at $4,000, which includes 8M bytes of random-access memory, 4M bytes of flash memory and chassis. A dual Ethernet module costs $3,000, while a dual token-ring card costs $4,000. An FDDI module costs $7,500, and a dual synchronous WAN card is priced at $2,300. The SPEX interface is $750.

Access Stack Node will be available Oct. 20.

✆Wellfleet: (508) 436-4000.

Coup

Continued from page 1

other communications assets, and assume responsibility for the railroad's net services and equipment for 10 years. There has been speculation among employees that the outsourcing deal could be a union-busting attempt.

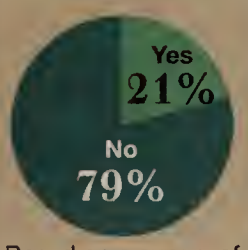
MOST EXCELLENT NET

Though CSX was a *NW* User Excellence Award winner in 1990, apparently the net has become outdated: CSX management described it as "obsolete and held together with chewing gum," according to the IBEW memo.

Also in the memo, the IBEW told CSX employees that the company's management had decided to get out of communications because it is not consistent with CSX's core business. The first year of an AT&T outsourcing deal would involve replacing the analog microwave and MCI Communications Corp. fiber links with high-speed AT&T facilities.

Hand it over

Is your company likely to outsource an aspect of network operations in the next 12 months?



Based on a survey of 270 users.

SOURCE: DATAQUEST, FRAMINGHAM, MASS.
GRAPHIC BY SUSAN J. CHAMPENY

In addition, the upgrade would include a heavy cellular and personal communications component.

TRANSPORTATION TREND

CSX's potential move speaks to a trend among companies pressured to deliver higher quality services while facing flat or declining networking budgets. Particularly stressed of late, it seems, are those in the transportation industry.

Witness, for example, AT&T's recent outsourcing deal with Delta Air Lines, Inc. (*NW*, Sept. 5, page 32).In that case, AT&T will absorb many Delta employees, and a newly combined venture will market services both to Delta and other companies. This should let Delta slash operational costs while adding a new revenue stream to its stagnant airline business.

And on CSX's own playground, Amtrak outsourced its system and network management to IBM's Integrated Systems Solutions Corp. (ISSC) subsidiary in a $500 million, 10-year deal in April. That contract followed on the heels of a $400 million IBM-ISSC net outsourcing deal with the Southern Pacific Transportation Co. railroad.

Outsourcing is becoming more acceptable because of a widening chasm between the rate at which new technology is being introduced and the rate at which workers can assimilate it, said Arnie Tomaino, an industry analyst for Dataquest, Inc.'s Worldwide Services Group in Framingham, Mass. This is particularly true as information systems staffs shrink, he said.

A CSX employee who asked not to be named, though, said he thinks firms lose control, flexibility, response time and quality control with outsourcing. "We're already paying AT&T millions each year. They shrug, and say they'll have someone over at 6 o'clock tomorrow when something goes wrong," he said.

However, he acknowledged that economies of scale make it easier for a public carrier running a net shared by many customers to stay up-to-date on the latest technologies than a company that must continually bear the brunt of new infrastructure investments alone.

An insider said the deal is expected to kick in after the first of the year, after the CSX workers' IBEW contract expires in December.

DB2

Continued from page 1

"It makes a lot of sense to use something like this. You could bring DB2 data down to the Oracle or Sybase level and create decision-support applications for end users," said John Webb, manager of database administration at Moody's Investors Service, Inc. in New York.

DataPropagator has two components. One piece runs on the server being replicated, while another piece resides on the target databases.

Staying in synch

Replication has become the most widely used way to synchronize distributed databases. It involves copying changes or entire databases from a primary site to multiple remote servers.

The DataJoiner middleware runs on RS/6000 servers, but a Sun Microsystems, Inc. Solaris version is planned. DataJoiner serves as a bridge between DB2 databases and target databases running on AIX, OS/2, DOS, Windows, Solaris and HP-UX computers. It converts data between DB2 and almost any other database.

In addition to replication, DataJoiner lets users do heterogeneous joins between each of the data sources, hiding the differences in SQL dialects.

Analysts said IBM's replication plan is aggressive and may win IBM some business among Oracle and Sybase customers.

"It's a bold move for IBM. It allows their customers to trust them a little more," said Norton Greenfield, director of Unix systems and applications at Computer Intelligence InfoCorp, Inc. in Westborough, Mass. "IBM is telling customers, 'We know you have a heterogeneous environment, and we're here to help.' It's exactly what they should be doing."

"Even if they sell their products to people who [have DB2 and] want to replicate and manage Oracle and Sybase databases, it's a viable strategy," said Shaku Atre, president of Atre Associates, Inc., a Port Chester, N.Y.-based consultancy. Clearly, they are hoping that those customers will be so pleased that they will buy DB2/2 or DB2/6000 for their downsizing needs, she said.

IBM will also roll out DataHub for Unix, which lets users manage DB2/6000 databases as well as those from Oracle and Sybase from a central point. It will run on AIX, HP-UX and Sun computers. The company currently offers an OS/2 version of DataHub.

DataHub comprises software that runs at the central control site and software for each database on the network. The control site communicates with the databases via TCP/IP.

DataHub lets users monitor database catalogs, which shows what tables are in the databases, and move tables. It will also launch database utilities such as reorganize, back up and recover, load and unload, and update statistics. In addition, users may grant and revoke user privileges via DataHub for any managed database. DataHub also displays information on units of work, locks on tables and how much work is waiting for the database.

IBM said it would roll out Simple Network Management Protocol agents next week for DB2 and DB2/6000 that work with DataHub, plus its NetView/6000 network management system and those from SunSoft, Inc. and HP.

These agents will let DataHub share information with the SNMP-based management systems, the company said.

The firm is also readying two graphical tools for managing DB2/2 and DB2/6000 databases from DataHub. DB2 Visual Explain provides a graphical picture of the SQL access paths and lets users modify the SQL code for more efficient data access. DB2 Performance Monitor lets users see bottlenecks and suggest tuning improvements.

DataJoiner will begin beta testing early next year. DataPropagator Relational will go into beta in December. Pricing and availability for those products were not available. DB2 Visual Explain for AIX and DB2 Performance Monitor for AIX will ship in February. Pricing was unavailable.

✆IBM: (800) 426-4785.

Groupware

Continued from page 1

WEST Technology, Inc. in Denver.

US WEST would love to give its rapidly growing number of Notes users access to its Oracle-based data warehouse, he said. To date, the company has had mixed results in pilot projects with a variety of Notes-to-Oracle tools.

Jeff Held, a partner in the technology services practice at Ernst & Young, a New York consulting firm, said the melding of Notes with Oracle Media Server is particularly attractive.

"People are already running into situations where the current version of Notes is running out of gas, at least in terms of sheer capacity," Held said. Earlier this year, the firm bought an image storage and retrieval system from Watermark Software, Inc. because it did not feel Lotus' Notes-based imaging product was robust enough.

Users could see some initial integration efforts by January, starting with the ability of Notes clients and servers to retrieve multimedia objects from Oracle databases. Tight integration between Notes and transaction processing data stored in Oracle databases could come with Version 4.0 of Notes, due out by mid-1995.

Oracle oops

Just in case, Oracle had two press releases ready last week — one announcing a deal with Lotus, the other announcing Oracle's plans to wipe out Notes with Oracle Documents. The latter press release leaked out early. "I made a mistake, I apologize, let's move on," said Oracle Senior Vice President Andre Boisvert.

QUICK ACCESS

One key issue that is yet to be resolved is how to give Notes users quick access to large volumes of transactional data from Oracle databases. Potential approaches include a replication-based method for bulk shipments of data between Notes and Oracle or a meshing of the products' application program interfaces. The replication approach would be similar to that used by Trinzic Corp.'s InfoPump product.

Officials from both companies said they began negotiations several months ago, even as Oracle readied its Oracle Documents groupware suite. Oracle still plans to launch Oracle Documents in the first quarter of 1995, but now key pieces of that suite and Oracle's Media Server will be offered to users as a way to beef up Notes.

Users, for example, will be able to use Media Server to store complex Notes objects, such as video clips. Oracle Library, a component of Oracle Documents, will be offered as a document management system for Notes.

John Landry, senior vice president at Lotus, said the Notes/Oracle combo could provide a powerful workflow system, as well.

For example, a Notes user could call up financial information stored in an Oracle database, attach multimedia objects from Oracle Library and then route it around his department via Notes.

Peter O'Kelly, product manager for Notes application development at Lotus, said that with Notes 4.0, Lotus will likely ship a set of tools aimed at stitching Notes and Oracle together. These tools will be additions to the LotusScript 3GL and to a set of C++ class libraries that Lotus is currently developing, he said.

Lotus and other companies already offer software that lets Notes users access data from Oracle and other back-end databases; most, however, provide single-transaction access rather than the ability to quickly access large volumes of data.

"The value of Lotus Notes applied to large corporate enterprises is well established."

Larry Ellison
President and CEO, Oracle

"We are not replacing the Notes object store with Oracle7."

Jeff Papows
Vice president, Communications Products Division, Lotus

ATM

Continued from page 1

tive voice support, ATM will not meet the cost-justifications that most companies demand as they look to broadband networking.

"We could use the rubber bandwidth of ATM, but any broadband service has to support our voice traffic," said Derek Archer, senior design architect for Charles Schwab & Company, Inc. in San Francisco.

The only way Charles Schwab can justify the multimegabit-per-second wide-area links that its data applications need is by using the same lines to carry voice. That's what the firm has done, putting off ATM while pursuing time-division multiplexer (TDM) alternatives over T-3 and Synchronous Optical Network (SONET).

"Circuit emulation [for carrying voice lines over ATM] is not adequate and will not serve while we wait for real voice capabilities," Archer said.

"We see a lot of early ATM user trials, but most companies wash out of ATM — sometimes for good — when they try to tackle voice-related cost-justifications," said Tomas Nolle, president of CIMI Corp. in Voorhees, N.J.

CIRCUIT EMULATION

Constant bit rate traffic such as voice is typically carried on ATM using ATM Adaptation Layer 1 (AAL1) to map a standard T-1 circuit onto a stream of ATM cells. The resultant pipe is an imitation of a circuit-switched T-1 link, hence the term circuit emulation.

But mapping a T-1 line onto, say, a 45M bit/sec ATM backbone requires 18% overhead, not just for 5-byte ATM headers but for additional framing bytes, as well. That is the first problem: It lops five T-1s from the normal capacity of a T-3 line, and most users are not happy with such an equation.

It gets worse. Circuit emulation consumes bandwidth even when there is no traffic. It is a nailed-up circuit, and when idle, it can't absorb bursting traffic from other applications.

This undermines the point of ATM, which is based on the idea of efficiently multiplexing all types of traffic. The AAL1 standard cannot be modified to share idle bandwidth; that work awaits other standards that have yet to get underway.

Many suggest patience and note that the groundwork for integrating voice into ATM is being laid. Switched virtual circuits (SVC), for instance, are a prerequisite for useful voice services. SVC standards are done, and implementations by carriers and vendors are under way.

According to this view, users can initially cost-justify ATM for data alone, with voice support to follow as an added bonus.

But this optimism is couched in agendas. Piggybacking voice traffic on data circuits does save money, but nothing like what could be saved by consolidating all voice and data over one access link. Piggybacking is an afterthought, not true consolidation.

If voice traffic is high enough to justify T-3 costs, then one solution would be to feed a T-3 link with a TDM that carries all traffic. ATM traffic could be given a slice of that T-3 pipe, while voice is carried in traditional circuit-switched mode.

This is an approach touted by T-3 mux vendors such as T3plus Networking, Inc. and Larscom, Inc. A 6M or 10M bit/sec ATM channel can be created by inverse-multiplexing multiple T-1 streams. But this is a proprietary solution. There are no standards for ATM inverse multiplexing, explained Ron Toth, AT&T's Interspan ATM product manager.

Similarly, there are no standards for a fractional T-3 ATM service. So the only standard means of aggregating voice and data over ATM is to use a T-3 ATM interface that carries voice channels via circuit emulation.

Toth said AT&T will offer a service next year to do that. AT&T Interspan's integrated ATM service will carry voice, frame relay and ATM to the central office. Voice will ride on emulated circuits and be peeled off at the central office as normal circuit-switched traffic.

But the ATM traffic will not be carried as cells. Instead, it will ride to the central office as ATM Data Exchange Interface (DXI) frames, similar to frame relay.

AT&T will take this approach because only ATM DXI is standardized for use as an inverse-multiplexed fractional T-3 service. At the central office, the DXI traffic would be demultiplexed, turned into true ATM and then carried through the network over T-3 ATM trunks.

"We see this as an intermediate step to help meld ATM and voice," Toth said. "The end state ultimately will see packetized voice and video in the way that ATM is intended, but those [standards] are just beginning."

"We see this as an intermediate step to help meld ATM and voice," AT&T Interspan's Toth said.

Only two vendors so far have tackled voice over ATM using something more than AAL1 circuit emulation. StrataCom, Inc. has voice experience stemming from its cell-based IPX switch.

But the IPX is not an ATM switch, and StrataCom's BPX voice support appears limited so far to circuit emulation. "They haven't done anything to embody their belief in voice and ATM," Nolle said. "It's curious because they are in a position to."

Northern Telecom, Inc. demonstrated voice over ATM at NetWorld+Interop in Atlanta last month, using its Magellan Passport switch. The Passport currently supports frame relay, not ATM, but internally uses a cell-relay protocol that can seamlessly support ATM.

Passport's voice over ATM capability will be generally available by second-quarter 1995, according to David Ramos, NTI's assistant vice president of marketing.

Nolle said a few other WAN vendors will begin fleshing out their more involved voice strategies next year. But carrier ATM services are likely to focus on data even as voice capabilities and standards improve.

Users that demand tightly integrated voice/data/video ATM will probably have to build it themselves using private switches and leased lines.

Comments?

See "How to reach us" on the back page.

NETWORK WORLD

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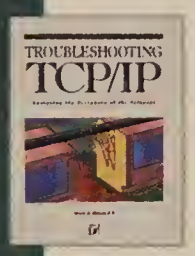

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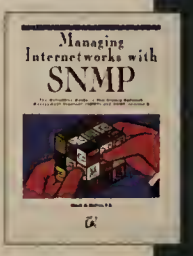

- Learn the details of the key elements of the Internet Network Management framework: the SMI, the MIB and the SNMP.
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Back to Reality

The RBHC empire strikes back; voice and data refuse to marry.

BY DAVID J. BUERGER

They say it's not politic to disagree with your boss, especially when you've been on the job for just a few weeks. But *Network World* Editor in Chief John Gallant is paying me to make heads turn, so why not start with his, right?

Gallant's editorial on page 50 deflects the brunt of blame for the recent killing of the telecommunications reform bill off the regional Bell telephone companies and onto Congress. To this I say: John, you made some good points but were too nice to the Bells.

Rep. Edward Markey (D-Mass.), chairman of the House Sub-Committee on Telecommunications and Finance, last week said at the Networked Economy conference in Washington, D.C. that Congress blew a historic opportunity to revamp our ancient telecommunications laws.

But the problem was not Congress per se; congressmen knew which side their bread was buttered on. The gridlock was nothing more than obeisance to their true master: Darth Vader Bell.

"The hand of certain large telephone utilities was shown," Markey said. "They want to call all the shots in their region, just like before we broke up AT&T." Markey sounded angry and cynical: "A few local telephone companies hold us hostage."

Actually, there are many Vaders, some darker than others. Shades aside, the regional Bells *are* to blame and deserve the full wrath of every network manager.

The failure to revamp telecom law is a travesty that will hamper the growth and cost-efficiency of networks for years to come. A key objective was to change local telecom markets from monopolies that controlled 99% of traffic to competitive situations that offered users more choices and put pressure on pricing.

That goal failed.

Events unraveled because local telephone companies that had jumped on the Information Superhypeway bandwagon began to run some numbers. They decided there was more to lose than gain from competition. And they fled to retreat behind the armor of regulatory protection that has shielded them since 1934.

FCC Commissioner Reed Hundt pointed out last week that a year ago, industry executives demanded that government "get out of the way" and let them build the highway. "You were kidding," Hundt said. "You keep asking us to do things."

Hundt said the FCC is getting many more requests to use regulation to preserve traditional bastions of regulated monopolies. Not everyone is pleased, however. As Hundt detailed the "successes" of cable rate restructuring, for instance, Tele-Communications, Inc. President and CEO John Malone grimly shook his head no. One monopolist's success apparently is another one's toll.

The Bells may have hoped to crush new competitors by influencing the death of telecom reform, but their shortsighted action is bound to boomerang as would-be data highway pavers turn to state governments and the courts for access.

Users will suffer in the short term because entrepreneurs who wish to offer network managers more choice in local access will have to siphon creative energies and resources away from product development into legal fees.

Eventually, the monopolies will be cracked, of course, but access will come at a high cost.

One prediction is virtually certain: As the Baby Bells' market share declines, so will their goodwill. Maybe they should rethink the situation and shuck the dark cloaks. Nah, that's too easy. Besides, too many lobbyists would lose their jobs. That would be bad for Washington's economy.

VOICE, DATA DO THE LIMBO

What are we going to do with this ongoing battle between voice and data? It's getting to be downright silly, but our story on problems carrying voice over Asynchronous Transfer Mode services unearths a nontechnical issue that frequently blocks the creation of efficient networks.

In the real world of organizations that implement voice and data transmission systems, political differences often result in the use of parallel networks — one for voice and one for data.

The irony is that digitally speaking, there is no distinguishable difference between voice and data; it's all a collection of ones and zeros. The transmission pattern may differ, but the technical foundation is the same.

Money ultimately drives most technology decisions, but ATM's adoption rate could well be held hostage to politics.

Can't *someone* in organizations with dueling networks call a truce? It could be worth a bargain on the cost of network services.

UNIVERSAL WINDOW

Lotus Development Corp.'s Notes software is quickly becoming a front end to everything. The company's deal with Oracle Corp. to let Notes users tap into Oracle7's Media Server — especially to transactional data stored on that database — seems on the surface like a good thing.

The downside might come when network managers tabulate the bill for running transaction data through a wide-area Notes network.

The issue is bandwidth efficiency, especially for remote and mobile workers. Notes consumes lots of bandwidth for data replication. This may be one case where ease of access is not worth the price.

Buerger is an industry consultant and contributing editor to *Network World*. You can send your reactions to dbuerger@pipeline.com or call (516) 883-4944. Flames are welcome.

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CyberSpeak

Voices from the reader network

Would you employ your telephone company to do LAN/WAN integration?

◆ "At the outset, no. I would give them a couple of years in the business in order to gain some experience. When they're first starting out, there's a lot to learn.

"And besides that, maybe the prices will get lower."

Kathy Kritscher, Chevron Information Technology Co., San Ramon, Calif.

◆ "Bell Labs, sí. Telcos, nyet.

"AT&T and its spin-offs have major problems simply bringing up an X.25 link. Integration? Excuuuuse me."

John Owens, director of telecommunications, USDA, Farmers Home Administration, St. Louis

◆ "It's tricky. On the one hand, yes I would, because they include a very important link — the communications lines.

"On the other hand, they really don't have any LAN expertise."

Van Muller, general manager, PVM Oil Associates, Inc., Teaneck, N.J.

NextWeek CyberSpeak Out!

Will replication technology play an important role in distributing databases?

Responses due by 8 p.m. Thursday, Oct. 6. You'll get a T-shirt if we print your response. Please include your name, company and address.

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